**United Nations Development Programme**

| | | |
|---|---|---|
| **Project title:** A systemic approach to sustainable urbanization and resource efficiency in Greater Amman Municipality (GAM) | | |
| **Country:** Jordan | **Implementing Partner:** Greater Amman Municipality (GAM) | **Management Arrangements:** National Implementation Modality (NIM) |
| **UNDAF/Country Programme Outcome**: *Outcome 5: Government and national institutions have operationalized mechanisms to develop and implement strategies and plans targeting key cultural, environmental and Disaster Risk Reduction issues (including a transition to a Green Economy) at national and sub-national levels.* | | |
| **UNDP Strategic Plan Output:** *Output 1.5. Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy).* | | |
| **UNDP Social and Environmental Screening Category:** Moderate | | **UNDP Gender Marker:** *2* |
| **Atlas Proposal/Award ID:** 00107209 | | **Atlas output Project ID:** 00107565 |
| **UNDP-GEF PIMS ID:** 5543 | | **GEF ID:** 9204 |
| **Planned start date:** *January 1, 2018* | | **Planned end date:** *December 31, 2022* |
| **FINANCING PLAN** | | |
| GEF Trust Fund | | US$ 2,640,000 |
| **(1) Total GEF Budget** | | **US$ 2,640,000** |
| **PARALLEL CO-FINANCING** | | |
| UNDP TRAC resources | | US$ 100,000 |
| UNDP (in-kind) | | US$ 150,000 |
| Recipient Government/GAM (cash) | | US$ 9,000,000 |
| Recipient Government/GAM (in-kind) | | US$ 2,850,000 |
| Recipient Government/Ministry of Environment (cash) | | US$ 800,000 |
| Recipient Government/Ministry of Environment (in-kind) | | US$ 200,000 |
| Recipient Government/MOPIC (in-kind) | | US$ 3,000,000 |
| NGO/WEEC (in-kind) | | US$ 15,000 |
| Private Sector/Hussein Maaitah & Partner Co Ltd (cash) | | US$ 2,750,000 |
| Private Sector/Al Tarek Co Ltd (cash) | | US$ 3,000,000 |
| Beneficiary/Fadi Thaer Residential Building Committee (in-kind) | | US$ 150,000 |
| **(2) Total co-financing** | | **US$ 22,015,000** |
| **(3) Grand-Total Project Financing (1)+(2)** | | **US$ 24,655,000** |

**Brief project description:**

The UNDP-GEF project is designed to promote low-carbon buildings in Greater Amman Municipality, and eventually in other municipalities and cities in Jordan, through the application of Building Energy Codes, and in particular the Thermal Insulation Code for new buildings, and retrofit guidelines for existing buildings. The project will directly support the implementation of the National Energy Efficiency Action Plan 2016, and the

National Green Growth Plan 2016. This will be achieved through four outcomes: (i) putting in place planning and monitoring frameworks to foster accelerated low-carbon development in GAM and benchmark progress against established international standards; (ii) strengthening the enabling conditions, methodologies and tools in GAM for enforcing regulatory frameworks for EE buildings and street lighting; (iii) an integrated climate monitoring and finance framework is established for the development of urban NAMAs, and appropriate financial de-risking tools are identified and supported to promote adoption of EE measures in buildings attached to MRV systems; and (iv) selected proof-of-concept mitigation interventions to operationalize the outputs under the previous outcomes.

The lifetime global environment benefits will accrue from enhancing building thermal insulation in a combination of six proof-of-concept buildings in Amman and will be ~11.4 $ktCO_{2e}$. Consequential emission reductions amounting to ~7.2 $MtCO_{2e}$ are expected between 2018 and 2042 predominantly through the enforcement of Codes. The project yields a GEF abatement cost of 0.365 US$/$tCO_2e$. The project will produce co-benefits such as job creation for enhancing building envelope thermal insulation, and the reduction in water used in buildings that will increase the water resilience of urban areas to an already water-stressed situation.

**SIGNATURES**

| | | |
|---|---|---|
| **Signature:** | **Agreed by Government** | **Date/Month/Year:** |
| **Signature:** | **Agreed by Implementing Partner** | **Date/Month/Year:** |
| **Signature:** | **Agreed by UNDP** | **Date/Month/Year:** |

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| **AfD** | Agence Française de Développement |
| **BAU** | Business As Usual |
| **CBA** | Cost Benefit Analysis |
| **CCD** | Climate Change Directorate |
| **CDM** | Clean Development Mechanism |
| **$CH_4$** | Methane |
| **CO** | UNDP Country Office |
| **CPAP** | Country Programme Action Plan |
| **DEEI** | Derisking Energy Efficiency Investment |
| **DMS** | Data Management System |
| **DNA** | Designated National Authority |
| **EBRD** | European Bank for Reconstruction and Development |
| **EE** | Energy Efficiency |
| **EMRC** | Energy and Minerals Regulatory Commission |
| **EPC** | Energy Performance Contract |
| **ESCB** | Energy Sector Capacity Building (USAID) |
| **ESCO** | Energy Service Company |
| **ESP** | Energy Service Provider |
| **EU** | European Union |
| **FBUR** | First Biennial Update Report |
| **FTE** | Full-time Equivalent |
| **GAM** | Greater Amman Municipality |
| **GAMGP** | Greater Amman Metropolitan Growth Plan |
| **GDP** | Gross Domestic Product |
| **GEF** | Global Environment Facility |
| **GEU** | Green Economy Unit |
| **GGGI** | Global Green Growth Institute |
| **GHG** | Greenhouse Gas |
| **HDD** | Heating Degree Day |
| **INDC** | Intended Nationally Determined Contribution |
| **IPCC** | Inter-governmental Panel on Climate Change |
| **JAIMS** | Jordan Aid Information Management System |
| **JEF** | Jordan Environment Fund |
| **JREEEF** | Jordan Renewable Energy and Energy Efficiency Fund |
| **LED** | Light Emitting Diode |
| **MACC** | Marginal Abatement Cost Curve |
| **MEMR** | Ministry of Energy and Mineral Resources |
| **MoPIC** | Ministry of Planning and International Cooperation |
| **MPWH** | Ministry of Public Works and Housing |
| **MRV** | Monitoring, Reporting and Verification |
| **$MtCO_2e$** | Million tonnes of Carbon Dioxide Equivalent |
| **MWI** | Ministry of Water and Irrigation |
| **NAMA** | Nationally Appropriate Mitigation Action |
| **NAPA** | National Adaptation Programme of Action |
| **NCCC** | National Climate Change Committee |
| **NCCP** | National Climate Change Policy |
| **NEEAP** | National Energy Efficiency Action Plan |

| | |
|---|---|
| **NERC** | National Energy Research Centre |
| **NGGP** | National Green Growth Plan |
| **NGO** | Non-Governmental Organisation |
| **NIM** | National Implementation Modality |
| **NPD** | National Project Director |
| **PM** | Project Manager |
| **PMR** | Partnership for Market Readiness |
| **PMU** | Project Management Unit |
| | |
| **PPG** | Project Preparation Grant |
| **PSC** | Project Steering Committee |
| **PV** | Photovoltaics |
| **RE** | Renewable Energy |
| | |
| **SBAA** | Standard Basic Assistance Agreement |
| **SDD** | Sustainable Development Department |
| **SESP** | Social and Environmental Screening Procedure |
| **SDG** | Sustainable Development Goal |
| **SWH** | Solar Water Heater |
| **$tCO_2e$** | Tonnes of Carbon Dioxide Equivalent |
| **TNC** | Third National Communication to the UNFCCC |
| **ToC** | Theory of Change |
| **UNDP** | United Nations Development Programme |
| **UNEP** | United Nations Environment Programme |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **USAID** | United States Agency for International Development |
| **US$** | United States Dollar |

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## 1. DEVELOPMENT CHALLENGE

1. A rapid increase in economic activity, population growth and successive influxes of refugees over the last decade have imposed huge stresses on Jordan's urban areas and fragile water and energy resources. Sitting at the crossroads of two major areas of instability and prolonged conflicts, Jordan was originally a prime destination for several waves of forced migrants from Palestine – the majority of whom were granted Jordanian citizenship – and, more recently, from Syria, Lebanon and Iraq. With the conflict in Syria entering its fifth year, Jordan is now hosting 1.4 million Syrians, of whom 646,700 are refugees. Approximately 85% of these refugees, 550,000 in total, are living in non-camp settings in urban and rural areas. The highest concentrations are in northern and central Jordan, including the capital city, Amman, with the largest proportion (28%); a significant proportion are classified as extremely vulnerable and approximately 24% of all Syrian refugees are women and almost 53% are children. In March 2014, the Government of Jordan launched the National Resilience Plan (NRP) in cooperation with the United Nations, various donors and NGOs; the NRP seeks to address the growing fiscal burden faced by the Kingdom as a result of the Syrian crisis. The NRP includes a request for US$ 4.295 billion to support the implementation of priority projects in the education, health, energy, municipality, water, housing and security sectors.

2. Providing for the needs of Syrian refugees has impacted heavily on the Greater Amman Municipality's public finances, increasing expenditures on subsidies and public services, and further degrading the built environment. For example, beyond targeted programmes (via direct budget assistance) to assist refugees and vulnerable households in host communities, the Jordanian Government estimates that, in 2015, it will incur additional subsidies on food, gas, water and electricity for refugees amounting to US$ 418 million and accelerated infrastructure depreciation totalling US$ 244 million (Jordan Response Plan – JRP - for the Syrian Crisis, United Nations and Government of Jordan, 2015).

3. Despite these challenges, Amman continues to be the focal point of the Jordanian economy, commanding the majority of Jordan's total investment while accounting for 39% of the total population (over 50% if Zarqa is included) and showcasing nascent but vibrant local technology and service sectors (Jordan was the best performing non-oil economy in the MENA region as measured by real GDP growth between 1999 and 2013).

4. At a city level, the Greater Amman Municipality (GAM)[1] developed the Amman Master Plan (AMP) in 2010: this Plan provides a vision for the growth of the city until 2025, with a clear overarching focus on climate-resilient development, the creation of green jobs, and a strive for resource efficiency in all aspects of municipal planning and investments. The AMP is reflective of a city and a country with limited indigenous energy and water resources and one that is heavily dependent on imports of energy to meet growing demand, expected to double by 2020. Jordan imports 96% of its oil and gas, accounting for almost 20% of the country's GDP, which makes the country completely reliant on, and vulnerable to, the global energy market. The Kingdom is ranked third among the 18 countries in the world considered to be at risk of water insecurity. Current total water use in the country exceeds the renewable supply. If supply remains constant, per capita domestic consumption is projected to fall to 90 cubic metres per person per year by 2025, putting Jordan in the category of having an absolute water shortage that could constrain economic growth and potentially endanger public health (National Climate Change Strategy of Jordan, 2013). Municipal water use (including in the GAM) is currently met primarily using groundwater sources. In most urban sites in Jordan, water is supplied on an intermittent, rationed basis that requires household storage in cisterns and/or roof tanks. The JRP further notes that "Delivery frequency is insufficient and has worsened as a result of the increased demand and households have to supplement their supply by purchasing water. The influx of Syrian refugees has also increased pressure on already limited sewage and communal waste systems, which only cover 62% of the Jordanian population."

[1] GAM is the municipality (Amanah) for the Amman Governorate of Jordan.

5. Under Jordan's National Agenda (2006-2015), "environmentally sustainable economic development" is a key policy goal, and is reflected in a wide range of sectoral planning, including sustainable energy and infrastructure. In January 2013, a milestone was achieved in Jordan with the launch and adoption of the first National Policy on Climate Change. The Policy was drafted to accommodate national climate change priorities and to provide a policy reference point upon which further strategies and sectoral policies can be based. The long-term goal of the Policy is to achieve a proactive, climate risk-resilient Jordan and to enable a low-carbon but growing economy, with healthy, sustainable and resilient communities; sustainable water and agricultural resources; and thriving and productive ecosystems. In parallel, the energy sector response strategy under the Government's JRP proposes "to meet the additional power required in urban areas as a result of refugees' needs through energy efficiency and renewable energy solutions, while building on existing capacities and initiatives."

6. As noted in **TABLE 1** below, the energy sector is by far the largest source of greenhouse gas (GHG) emissions in Jordan. On a per gas basis, the contribution of the energy sector in the reference year 2006 was 87% of the total $CO_2$ emissions of the country, 1% of the $CH_4$ emissions, 48% of the Non-Methane Volatile Organic Compound (NMVOC) emissions and more than 99% of the total emissions of $NO_x$, CO and $SO_2$ (Jordan's Third National Communication on Climate Change, 2014). As also noted, the role of the energy sector and sub-sectors as the leading emitter of GHGs is expected to increase in the future from 73% of total emissions in the year 2006 to 83% in the year 2040. With regard to energy sub-sectors, electricity generation and transport are the leading emitters. The energy and emissions context of Jordan in discussed in **Annex SA1** (Supplementary Annex 1).

**TABLE 1. GHG emissions, baseline scenario for the energy sub-sectors for selected years (Gg $CO_{2e}$).**

| Emission Sources | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|
| Electricity | 7477 | 9140 | 12562 | 10114 | 17517 | 19019 | 19264 |
| Transport | 7573 | 9052 | 11145 | 13584 | 16221 | 18934 | 21550 |
| Industry | 1843 | 1407 | 1664 | 1947 | 2261 | 2605 | 2984 |
| Residential | 1471 | 1737 | 2030 | 2344 | 2684 | 3049 | 3332 |
| Commercial | 439 | 407 | 486 | 574 | 670 | 764 | 853 |
| Agriculture | 395 | 526 | 649 | 766 | 902 | 1046 | 1181 |
| Others* | 792 | 973 | 870 | 591 | 668 | 555 | 447 |
| **Total energy** | **19990** | **23242** | **29406** | **29920** | **40923** | **45972** | **49611** |

*:Emissions from refinery processes and fuel transportation

*Source: Jordan's Third National Communication (TNC), 2014*

7. *Energy Reforms and Targets*
Jordan's Nationally Determined Contribution (NDC)[2] establishes a 1.5% voluntary GHG reduction from 2006 levels compared to business as usual by 2030. An additional 12.5% GHG emission reduction is conditional upon availability of international climate finance. The International Finance Corporation (IFC) has estimated that US$487 million will be invested in new low-carbon buildings by 2020.[3] The analysis suggested significant prospects for energy efficiency (EE) in the commercial and household sectors, requiring more performance standards and incentives. The sector-specific emission reduction projects will be implemented under the guidance of the overarching national *Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020*.[4] **Annex SA2** (Supplementary Annex 2) provides more details.

[2] http://www4.unfccc.int/submissions/INDC/Published%20Documents/Jordan/1/Jordan%20INDCs%20Final.pdf – accessed 14 November 2016.

[3] IFC (2016), *Climate Investment Opportunities in Emerging Markets – an IFC analysis*: IFC, Washington, DC.

[4] Ministry of Environment (2013), *The National Climate Change Policy and Sector Guidance Framework of the Hashemite Kingdom of Jordan (2013-2020)*.

8. Jordan's National Energy Efficiency Action Plan (NEEAP), endorsed in 2013, sets a national energy efficiency (EE) target of a 20% reduction across all sectors by 2020 and proposes concrete measures in cities to guide Jordan towards achieving this target. The investment needed to reach this target is estimated at approximately US$ 152 million. On a positive note, Jordan now ranks second after Tunisia in the region in creating a favourable environment for energy efficiency investments[5], and Jordan's initial accomplishments in the energy sector during the past two years include implementation of a subsidy removal plan (whereby it eliminated all subsidies for oil products); adoption of its first national energy efficiency action plan; and formulation of minimum energy performance standards (MEPS) for household appliances (both of the latter achievements were accomplished with support from UNDP).

9. An updated NEEAP (2016-2020) has been developed with the ambitious target to save 15% of electricity by 2020 (2080 GWh), compared to the annual average electricity consumption between 2010 and 2014. The NEEAP 2016-2020 includes 16 measures covering residential, tertiary, industrial, water pumping and street lighting sectors. The multiple benefits that these measures are expected to produce are summarised in Table SA 2.2 of Annex SA.2 accompanying this Project Document.

10. A major step towards achieving the renewable energy and energy efficiency targets in Jordan was the issuance of the Renewable Energy and Energy Efficiency Law No (13). The Law provides the legal framework for renewable energy production and energy conservation incentives, and also establishes the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF) under the umbrella of the Ministry of Energy and Mineral Resources (MEMR). MEMR has issued a number of follow-up by-laws to complete the regulatory framework, including several designed to attract investments in renewable energy and energy efficiency. By-law No (73) on Regulating Procedures and Means of Conserving Energy and Improving Its Efficiency (passed in 2012) regulates the energy efficiency sector and requires large energy consumers to prepare and implement energy conservation plans. The by-law also requires buildings of a specific area size to install solar water heaters (SWHs). In the context of renewable energy, Jordan has now developed regulations whereby private investors and households may invest in their own PV system up to 5 MWp to directly consume the electricity produced and offset it against their demand within a net-metering scheme. In addition to off-grid installations, approximately 4 MWp of solar PV systems under the net-metering scheme have been realised, with another 5 MWp pending on the application process waiting list. Many of these systems are in the GAM.

11. The Government of Jordan and the GAM recognize that climate change mitigation and adaptation are an integral part of a much broader strategy for green growth and sustainable development. Authorities have already shown the political will to undertake many of the underlying regulatory reforms needed to catalyze green growth while GAM has committed to a vision of green and sustainable growth via the AMP. However, as observed in the latest AFEX report, **"Jordan still needs to strengthen its implementation capacity to properly capitalize on introduced energy efficiency policies"** and there is still a great deal of support needed for customized solutions at the city-level, particularly around enforcement of existing codes, proper monitoring of policies and targets, financial engineering and support for proof-of-concepts.

12. *Building energy efficiency and challenges*
A multi-criteria analysis (see **Annex SA1**) has already been undertaken suggesting that EE in buildings interventions should be the highest energy priority in Jordan with regard to cost-effectiveness and political buy-in/social acceptability. The choice of an intervention associated with energy efficient street lighting stems from several factors: it has already been identified as a quick-win project in the NEEAP; it is amenable to a city-wide approach; it has a high level of visibility and social acceptance; and it is technically straightforward to implement.

13. In light of these trends, and despite the initial accomplishments and regulatory reforms that the Government of Jordan and GAM have taken to shift to a more sustainable growth path, further integrated de-risking policies and platforms are needed across the energy and water nexus (with much higher levels of investment

[5] RCREEE (2015), *Arab Future Energy Index* – see http://www.rcreee.org/projects/arab-future-energy-index%E2%84%A2-afex).

in both sectors) for the GAM and Jordanian Government to meet their EE targets, conserve water and help authorities cope with the additional financial obligations and income losses resulting from the Syria crisis.

14. The major challenges that need to be addressed are (**Annex SA3** provides more details):

Barrier #1: Lack of systematic assessment, planning and reporting tools for optimized climate-resilient, resource-efficient development and decision-making at GAM: The AMP offers a general vision of climate-resilient green growth in the GAM. However, there is no GAM-specific sustainability plan or urban metabolism assessment for the city; climate change considerations as it relates to infrastructure and spatial planning decisions in the GAM still take place in an ad-hoc and sub-optimal manner. Moreover, there is no standardized common metric in place to measure the progress that the GAM has achieved and plans to achieve versus other urban areas;

Barrier #2: Lack of enabling conditions and tools for enforcing and enhancing regulatory frameworks (including financial incentives) for EE in the GAM: The prevailing practice shows that monitoring and enforcement of the current (less optimal) prescriptive EE regulations in Jordan and the GAM is not carried out systematically. Moreover, a sizeable portion of the potential for GHG emissions in GAM relate mostly to 'locked in' energy inefficiencies in existing buildings that will not comply with the existing codes and guidelines. In addition to enforcing Building Energy Codes in new buildings, there is a need to design similar codes to retrofit existing buildings;

Barrier #3: Information/Awareness and perception barriers about resource efficiency benefits: A general lack of knowledge and negative perception of the benefits of Building Energy Codes still exist among decision-makers, the banking sector and the general public in the GAM and Jordan as a whole. This lack of awareness regarding the socio-economic and environmental benefits of the Codes can be found among both policy decision-makers and end-users;

Barrier #4: Technical capacity barriers and absence of performance-based GHG monitoring frameworks and quality assurance: At present there is no one entity in the GAM responsible for development and enforcement of EE measures and a need for capacity strengthening human capacity on EE measures and compliance. There is also an absence of training and accreditation for energy service or savings companies (ESCOs) in the GAM for the selected Building Energy Codes, and no monitoring, reporting and verification (MRV) system determining and certifying emission reductions from investments in EE measures; and

Barrier #5: Lack of fiscal incentives for uptake of EE building measures and proof-of-concept investments in the GAM: Up until now, the lack of adequate financing and investment viability of EE measures in Jordan has been further complicated by heavily subsidized energy prices. EE investments can appear unattractive when business cases assume continued low energy prices, especially in the residential sector. Moreover, in the GAM and more generally there is a lack of information and understanding amongst financial institutions about EE technologies which makes it difficult to evaluate loan applications for EE investments.

## 2. STRATEGY

15. The Theory of Change (ToC) diagram for the GEF-financed and UNDP-implemented project shown in **Annex SA4** captures the linkages between the developmental challenge discussed in Section 1 and **Annex SA1** and its causes (as detailed in **Annex SA3**) and drivers. It also shows how the project interventions at the level of four project outcomes address the root causes of the problems related to the application of Building Energy Codes, and in particular the Thermal Insulation Code. It is also pointed out that the GEF-financed and UNDP-implemented project will also support the adoption of building envelope thermal insulation in existing buildings. The outputs are shown in the ToC diagram but they are not detailed. The detailed discussion of the project outcomes and outputs is the focus of Section 3.

16. The project will be implemented in the locality of the Greater Amman Municipality (GAM) as shown in **FIGURE 1**.

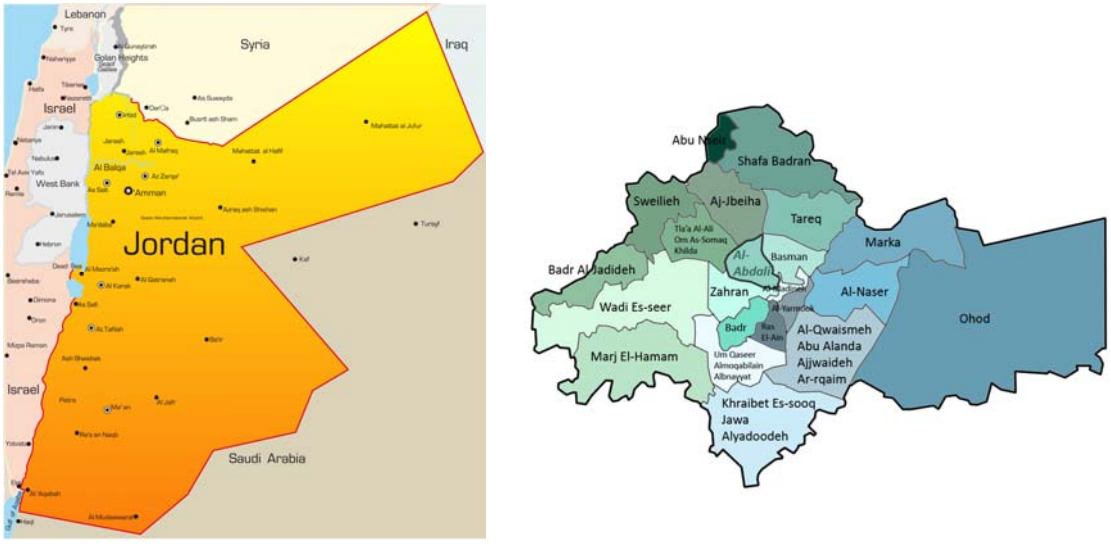



**FIGURE 1. Map of Jordan [left] and the boundaries of the Greater Amman Municipality (GAM) [right].**[6]

17. The long-term impact of the project is to achieve GHG emission reductions with strong sustainable development and adaptation co-benefits through implementation of thermal insulation in existing and new buildings (intermediate goal). The long-term outcomes of the project relate to addressing the five underlying problems that are discussed in **Table SA3.1**, namely: (1) lack of systematic assessment, planning and reporting tools for supporting decision-making at GAM; (2) lack of enabling conditions and tools for enforcing and enhancing regulatory frameworks; (3) information/awareness and perception barriers about resource efficiency benefits; (4) technical capacity barriers and absence of performance-based GHG monitoring frameworks and quality assurance; and (5) lack of incentives for uptake of EE building measures and proof-of-concept investments in GAM. The ultimate goal for the project is to deliver the socio-economic and ecological benefits as discussed in Section 1.

18. There are different drivers of change and assumptions that come into play at different levels in the ToC, as can be seen on **Figure SA4.1**. The external drivers are variables that fall outside the control of the project but which exert pressure in the relevant direction for justifying the project intervention. The key external drivers that will have a positive influence on the project logic are: (1) the high-level of energy use in Jordan that is accompanied by the unsustainably very high level of government subsidies; (2) population growth and rapid urbanization, which will increasingly necessitate innovative ways to deal with energy and water use in buildings. In the case of GAM, the problem has been exacerbated by the large influx of refugees (predominantly due to the conflict in Syria); and (3) an increasing realization that the innovative solutions should possess low-carbon and climate-resilient attributes, while at the same time addressing immediate socio-economic issues such as job creation, development of entrepreneurship skills and health concerns arising from energy and water use in buildings.

19. The main internal drivers of the project are: (1) the successful enforcement of existing Building Energy Codes (in particular the Thermal Insulation Code) in new buildings supported by incentives and awareness-raising. Accompanying this will be the incentives provided to building owners for retrofitting existing buildings with thermal insulation. This is the most critical element of the project since no global environmental (and other socio-economic) benefits can accrue without enforcement of Codes; (2) a performance-based system is established that will ensure the tracking of energy use and GHG emission reductions that will provide tangible evidence for investing in EE buildings; and (3) strengthened local

[6] http://jordanmap.facts.co/jordanmapof/jordanmap.php and https://fluswikien.hfwu.de/index.php?title=File:Amman_Districts.jpg – accessed 27 December 2016.

administration, namely GAM, with institutional and technical capacity for ensuring that Building and Occupancy Permits are only delivered to new buildings that abide by the Building Energy Codes (please see Section 3.1.2 for more details). It is expected that the technical assistance, incentives and enabling framework that will be put in place by the GEF-financed project will make the risk profile of investing in building thermal insulation so that the intermediate goal in the ToC is achieved.

20. The ToC contains a number of assumptions (shown in red boxes in **Figure SA4.1**). At the level of project interventions, the main assumptions are:
    - Political and institutional support received at all levels (National, GAM, other municipalities)
    - Public and Private (including households) sector engagement in implementing Thermal Insulation Code and retrofit guidelines for thermal insulation;
    - Reliable and accurate data is available for monitoring and evaluating the project;
    - Enforcement of Building Energy Codes;
    - Policy and financial de-risking instruments identified and implemented.

21. At the level of the long-term outcomes, the assumptions are:
    - Project trained human resources are retained in GAM and tools, incentives and MRV system operational in government institutions.
    - Regulatory and institutional frameworks and economic environment are conducive for investments in Building Energy Codes.
    - The Nationally Appropriate Mitigation Action (NAMA) modality is a useful means for scaling-up mitigation actions and delivering sustainable development co-benefits. This is vital to the project design and is one of the means for ensuring project sustainability as discussed in Section 4.4. The city-wide NAMA will support the scaling-up of thermal insulation in existing and new buildings in GAM and other municipalities in Jordan based on the operationalisation of the regulatory and institutional frameworks promoted by the GEF-financed, UNDP-implemented project.

22. The assumptions relating to the intermediate goal are as follows:
    - Building developers and owners are sufficiently stimulated by enabling environment and incentives to implement Building Energy Codes, especially the Thermal Insulation Code (and also the retrofit guidelines for implementing thermal insulation in existing buildings);
    - Sustainability is ensured beyond the project lifetime, including the mitigation of project risks.
    - Stakeholders are well coordinated to ensure enforcement of Building Energy Codes.

23. The strength of the project strategy is its adoption of a multi-stakeholder process (MSP). With a wide range of different project stakeholders (as summarized in **TABLE 11**) contributing to the outcomes of the project, project activities will not be operating in a vacuum but, rather, in a context where there are complementary baseline initiatives with which synergies must be forged to deliver maximum benefits productively (efficiently and effectively) to beneficiaries. Through the MSP, the project will deliver activities that will strengthen the supply and demand sides of building thermal insulation, build the confidence of the wide range of stakeholders on this project (from the building designers, contractors and builders to building developers and owners to providers of incentives to national and local administrations), and provide a NAMA to encourage scaling-up to achieve the mitigation and adaptation contributions of Jordan as per the Intended Nationally Determined Contribution (INDC) that the Hashemite Kingdom of Jordan submitted to the UNFCCC Secretariat prior to COP 21.[7] The emphasis on NAMAs to be 'transformational' implies a clear preference for a systemic approach (e.g. the decisions of CoP 18 and CoP 19).

24. Transformation through enforcement and incentives. As discussed above, one of the problems confronting the implementation of thermal insulation in buildings is the lack of enforcement of the Thermal Insulation

[7] Please see http://www4.unfccc.int/submissions/INDC/Published%20Documents/Jordan/1/Jordan%20INDCs%20Final.pdf – accessed 14 November 2016.

Code and the lack of incentives to drive changes in the behavior of markets for both new and existing buildings. These barriers persist despite the pressure exerted by external drivers for adopting energy efficiency in buildings, as well as the cost effectiveness of energy efficiency measures in general (as discussed in Section 4.1). This situation can be changed using a combination of enforcement of existing Building Energy Codes by putting in place the appropriate institutional structures for linking third party verifiers, a certification system and the issuance of Building and Occupancy Permits by the municipality. To change market behavior towards adopting the Thermal Insulation Code and retrofit guidelines, a combination of monetary and non-monetary incentives will be provided. The monetary incentives will take the form of fiscal incentives on municipal tax on housing and land, while the non-monetary incentives will take the form of increased floor area ratio (FAR) and building energy performance certificates. It is pointed out that the non-monetary incentives will translate into direct financial benefits in the form of higher real estate value of the thermally-insulated buildings.

The value addition that is obtained from the adoption of the Thermal Insulation Code and retrofit guidelines will not only provide mitigation, adaptation, socio-economic and ecological co-benefits, it will also reduce the macro-economic cost burden on energy subsidies as discussed in **Annex SA1**.

25. Multi-stakeholder process (MSP). A challenge in the enforcement of the Thermal Insulation Code and provision of incentievs is to ensure that there is proper engagement and coordination of all key stakeholders. This is even more pressing in the GEF-financed, UNDP-implemented project because interventions occur at distinct geographical and political levels (i.e. implementation at the municipal level while regulatory framework and fianncial incnetievs are designed and implemented at the national level). The two geographical levels relate to the physical location where project beneficiaries are found, namely: national (e.g. national institutions such as JNBC and Ministry of Finance), and regional (e.g. municipalities). The political levels are loci where policy decision-making (e.g. development of Building Codes and retrofit guidelines, design and administration of financial incentives, and issaunce of Building or Occupancy Permits) takes place in the Hashemite Kingdom of Jordan. The engagement of all project stakeholders (Section 3.3 below) at different geographical and political levels has been ensured through a rigorous stakeholder engagement process.

26. Knowledge management. Knowledge management has not been retained as a stand-alone component in the project design. Rather, knowledge management, as a means to an end, is a transversal issue that cuts across the project design and conceptualisation. Nevertheless, Output 3.5 seeks to capture and disseminate lessons learned and best practices within Jordan and other MENA countries. For instance, the development of an online tool under Component 2 for carrying out comparative socio-economic and environmental benefits of buildings with or without EE measures will be disseminated broadly to be used as a decision-making and pedagogical tool for promoting low-carbon buildings. Similarly, in Component 3, lessons-learned on the integrated city-wide NAMA will be compiled and disseminated. The MRV mechanism to be established to assist NAMA reporting will ensure that GHG baselines are standardised and that emission reduction targets and milestones are consistently monitored. The development and application of the MRV mechanism for GHG emission reductions will be institutionalised by integrating the project MRV system within the broader MRV framework that will be established at the national level by the Ministry of Environment. The Ministry of Environment, which is has the mandate for developing a coherent national MRV system, and which is overseeing the development of a national MRV framework and system under the First Biennial Update report (FBUR) and Partnership for Market Readiness (PMR) projects, will be closely involved in the project activities related to the development of the MRV system for the GHG emission reductions that the implementation of building thermal insulation are expected to deliver. From the targeted proof-of-concept work in Component 4, lessons learned on operationalising the GAM enabling framework, including enforcement, and the design and implementation of incentives, and the MRV system will be captured for replication (scaling up activities GAM and other municipalities in Jordan, and in other MENA countries).

## 3. RESULTS AND PARTNERSHIPS

### 3.1 Expected Results

27. Four components and outcomes have been developed to enhance the implementation of thermal insulation in buildings in GAM. The focus is on capacitating the GAM institutional framework to collaborate with other national institutions in order to enforce the implementation of the Building Energy Codes, and especially the Thermal Insulation Code as proposed in the draft NEEAP. Since energy, and hence GHG emissions, take place in existing buildings, the project, that will be scaled up through the development of an urban NAMA, will also support the development and implementation of thermal insulation retrofit guidelines for existing buildings in GAM. The promotion of low-carbon buildings will form part of a broader plan to manage the Greater Amman area more sustainably in terms of energy, water and materials throughput. Since capacity building has been integrated as a cross-cutting issue, it is not addressed as a stand-alone intervention.

28. An important aspect of the project design is the water-energy nexus that increases the sustainable development dividends of the project by addressing both climate change mitigation and adaptation through increasing the efficient use of water in buildings. The mitigation aspect of the water-energy nexus stems from the fact that the energy (and hence GHG) embodied in water supplied to buildings in GAM is high. The efficient use of water in buildings will result in lower water consumption in buildings, thereby decreasing the amount of energy needed to treat, transport and supply water to GAM. Reducing water use is a strategy for adapting to the already acute water stress situation in Jordan, and which is expected to be exacerbated by future climate change and variability. Assuming water losses in the water supply network may be as high as 50%,[8] the mitigation and adaptation benefits are doubled for every unit of water saved in buildings.

29. **Project objective:** *To assist the Greater Amman Municipality (GAM) improve the quality of life for its citizens and comply with the National Energy Efficiency Action Plan (NEEAP) via support for more sustainable resource-efficient urban planning and targeted low-carbon interventions in the municipal buildings and street lighting sub-sectors.*

30. An adaptive approach has been used to develop the project document. Consequently, a few changes have been brought to the project design in order to respond to changes in baseline activities and the changing context that have taken place during the relatively long-period of time taken for PIF approval. It is pointed here that the initial PIF was formulated for inclusion in the Sustainable Cities Integrated Approach Pilot (IAP), while expecting matching funding from the IAP. However, **the project concept was not retained for the Sustainable Cities IAP, but the scope of work (without receiving matching funding from the IAP) remained unchanged leaving an imbalance between project scope and funding**. The adaptive project design approach has sought to redress this imbalance without jeopardising the core elements of the project.

31. Prior to describing the project components, outcomes and outputs, the changes brought to the project design are listed in **TABLE 2**. Changes have been brought at the output level only, without changing the project components and corresponding outcomes. While relatively few outputs have been removed compared to the aforementioned discrepancy between scope and budget at PIF stage, the updated project design has also introduced either new outputs or increased the scope of others. Any new output that was not included in the PIF is shown in italics. Details on the changes are given in Sections 3.1.1, 3.1.2, 3.1.3, and 3.1.4.

**TABLE 2. Changes brought to the project design due to changes in baseline activities.**

[8] N. Al-Ansari, N. Alibrahiem, M. Alsaman, and S. Knutsson. 2014. Water Supply Network Losses in Jordan, J. of Water Resource and Conservation 6, 83-96; N. Al-Ansari, S. Al-Oun, W. Hadad, and S. Knutsson. 2013. Water loss in Mafraq Governorate, Jordan, Natural Science 5, 333-340.

| Output in PIF (or *new output*) | Changes made | Reasons for change |
|---|---|---|
| **Component 1 / Outcome 1** | | |
| Output 1.4. Amman benchmarked against other cities using ISO 37120 to measure the performance of city services and quality of life | Removed (based on guidance received from GAM) | As part of its commitment to pursuing sustainable development, the City of Amman is a member of the World Council on City Data (WCCD). As a global leader on standardised metrics, the WCCD is implementing ISO 37120 Sustainable Development of Communities: Indicators for City Services and Quality of Life, the new international standard; created by cities, for cities. On 7 December 2016, the City of Amman received the Platinum Certification from the WCCD for completing the ISO 37120 report for 2015.<br>More details are provided in the discussion of Output 1.2 in Section 3.1.1. |
| *Output 1.3: Institutional strengthening (Urban Planning Department and Amman Urban Observatory) for data analysis and reporting.* | Output added. | The Urban Planning Department (UPD) and the Amman Urban Observatory (AUO) are located in the GAM organisational structure. While the UPD is responsible for the physical development plan of GAM, and will play a central role in updating the Greater Amman Metropolitan Growth Plan, the AUO is responsible for collating and analysing city data for reporting purposes. Baseline assessments have shown deficiencies in the capacity of the AUO to fulfil its mandate. Further, the STAP had recommended that the UNDP-GEF project should collaborate closely with the Sustainable Cities IAP in order to adopt benchmarked and standardised tools and methodologies for measuring and reporting the sustainability performance of Amman. As discussed in Section 3.1.1 below, this recommendation of STAP has been fully integrated in the project design and development. The UPD and AUO are the clear candidate for receiving capacity building on these tools and methodologies that will be developed by the GEF-financed Global Platform for Sustainable Cities (GPSC). Consequently, a new output has been added for enhancing the institutional capacity of the UPD and the AUO. |
| Component 2 / Outcome 2 | | |
| Output 1.8: Development of a web-based geospatial tool that provides a topographical plan of main buildings in the city of Amman. | Removed (based on guidance received from project stakeholders) | Project stakeholders have commented that, although it is desirable, this output was too far removed from the core issue of promoting low-carbon building by putting in place the necessary conditions for the enforcement of Building Energy Codes, and in particular the Thermal Insulation Code. Removing this output also seeks to bring more balance between the scope of the project and available funding as discussed at paragraph 30 above. |
| Output 2.5: At least 20 | Modified (based on | Discussions with project stakeholders have revealed |

| | | |
|---|---|---|
| ESCOs/RESCOs accredited and capacitated via programme | guidance received from project stakeholders) | that the number of ESCOs was not realistic given that the EE in buildings in Jordan was nascent. Hence, it was decided that the number will be changed downwards to 5 ESCOs but with all of them focusing on thermal insulation in buildings. As discussed in section 3.1.2, an accreditation scheme for Energy Service Providers (ESPs) is in place, hence catering for other aspects of EE in buildings such as heating and air conditioning that will not be the focus of the UNDP-GEF project. This approach brings the project more in line with its core objective at promoting low-carbon buildings through the implementation of building thermal insulation. |
| Component 4 / Outcome 4 | | |
| Output 4.2: 2-4 new public-sector buildings (either schools or hospitals) integrating best practice resource efficiency measures are supported | removed | The JREEEF is now sufficiently capitalised and it has an action plan to 2020. The action plan already considers the implementation of this output. Hence, stakeholders have suggested its removal and to make better use of the investment funding to have impact at scale (rather than diluting the funding over a multitude of low-impact interventions). Please see the changes brought to Output 4.3 described below. |
| Output 4.3: 1-2 existing public-sector buildings are retrofitted | Modified (based on stakeholder recommendation) | The scale of this output has been **increased** with interventions planned in 4 existing buildings. This modification is motivated by the fact that while energy efficiency in new public buildings was now receiving support from JREEEF, no attention was being given to existing buildings that utilise most energy (compared to new buildings), and hence, contribute to most emissions in the city. The increased scale of this output is also a way to counter balance the removal of output 4.2. |

### 3.1.1 Component 1: Urban sustainability planning tools and benchmarks

32. The expected outcome from outputs proposed in Component 1 is *"Planning and monitoring frameworks in place to foster accelerated low-carbon development in GAM and benchmark progress against established international standards".*

33. The proposed outputs of Component 1 have been chosen to address Barrier #1 in Section 1, and they consist of:

Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.
Output 1.2: Quantification of all energy, water and material flows in the GAM.
Output 1.3: Institutional strengthening (Urban Planning Department and Amman Urban Observatory) for data analysis and reporting.
Output 1.4: Assessment and costing of awareness-raising campaigns for the Sustainability Plan.

34. *Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.* At present the National Policy on Climate Change (NPCC) provides an overarching (umbrella/high level) guidance for the Government and its sub-national actors to implement

the major climate change priorities related to adaptation and mitigation, while the Vision 2025 provides the long-term development objectives and pathway for Jordan. (See **Annex SA2** for details concerning national policies, strategies and action plans). At the city level, the Greater Amman Metropolitan Growth Plan (GAMGP) offers a general vision of climate-resilient green growth in the GAM. However, the GAMGP was developed in 2008[9] and has not been updated since despite significant changes in the metropolitan landscape due to a large influx of refugees, principally from the conflict in Syria.

35. However, there is no GAM-specific sustainability plan for the city and this is despite the fact that the City of Amman forms part of the 100 Resilient Cities network, which requires participating cities to have in place a sustainability strategy and action plan, among others.[10] Climate change considerations as it relates to infrastructure and spatial planning decisions in the GAM still take place in an ad-hoc and sub-optimal manner. A draft Sustainability Plan was developed for Greater Amman by the Arab League but it was never endorsed.[11]

36. The Global Green Growth Institute (GGGI) is supporting the Hashemite Kingdom of Jordan to develop a National Green Growth Plan (NGGP), which for all practical purposes will have to be implemented at the sub-national (e.g. city, municipal, governorate, district-levels). Further, the city of Amman forms part of the Compact of Mayors (C40), and it has completed its commitment to manage GHG emissions and reported its GHG inventory. However, it is yet to establish a climate change mitigation plan with emission reduction targets.[12] In addition to translating Vision 2025 at the sub-national level, it is, therefore, timely for GAM to develop its Sustainability Plan, which will also allow the city to communicate its sustainability and climate change strategies and action plans to the 100 Resilient Cities network.[13]

37. The Sustainability Plan will be developed using the Urban Sustainability Framework (USF) that is being developed[14] by the Global Platform for Sustainable Cities (GPSC) under the aegis of the GEF-financed Sustainable Cities Integrated Approach Pilot. The GPSC does not intend to impose a uniform model of urban sustainability but instead will draw from good practices of integrated approaches to help cities identify, enhance or develop its modality of urban sustainability planning. The key components of the USF are shown in **FIGURE 2**. They would include:

- Sustainability Indicators: The key targets for SDG 11 will form the core set of indicators for the USF. These targets are given in **Annex SA2**.
- Diagnostic process to assess cities' urban sustainability status: Together with the key targets for SDG 11, the USF has proposed an extended list of reference indicators (see **Annex SA2**) that will be used by cities for benchmarking its sustainability status. Also, the USF will capacitate participating cities to use geospatial information in conjunction with socioeconomic modelling to establishing the baseline status of the city. The UNDP-GEF project will finance the participation of 4 selected persons from

[9] Greater Amman Municipality. 2008. The Amman Plan – Metropolitan Growth: Summary Report; and discussions held with Eng. Zaidoun Eqsalem, Senior Environmental Advisor, GAM on Wednesday 7 December 2016.

[10] http://www.100resilientcities.org/cities#/-_/ - accessed 25 December 2016.

[11] Information provided by Eng. Zaidoun Eqsalem, Senior Environmental Advisor, GAM on Wednesday 7 December 2016.

[12] https://www.compactofmayors.org/cities/ - accessed 27 December 2016.

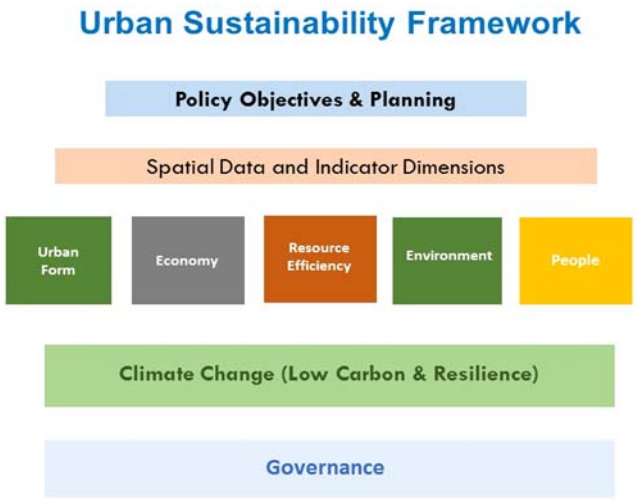
[13] The 100 Resilient Cities network has adopted a City Resilient Framework (CRF) that is built on four essential dimensions of urban resilience: (1) Health & Wellbeing; (2) Economy & Society; (3) Infrastructure & Environment; and (4) Leadership & Strategy. Each dimension has three drivers, and one of the drivers related to Leadership & Strategy is: "Fosters Long-Term & Integrated Planning". The City of Amman is yet to fulfill the requirements related to developing and implementing a long-term and integrated sustainability plan for enhancing its resilience. For more, please see http://www.100resilientcities.org/resilience#/-_/.

[14] The draft version of the USF was obtained from the Programme Coordinator, GPSC on 7 February 2017. It is expected to be validated at the GPSC Global Meeting that will take place between 15 and 19 May 2017 in Suto, China.

GAM and relevant public institutions to participate in the capacity building workshops offered by the GPSC.

- Using indicators to benchmark city's urban sustainability status
- Conducting and analysing cities' growth scenarios (e.g. current policies vs. optimal policies)

- Developing city's Sustainability Action Plan: A collaborative approach[15] to developing an action plan, through consultations with relevant stakeholders will help to create a shared vision and action plan that is not only highly relevant to the city and its people's needs, but also politically supported. A Monitoring Framework will provide the use of necessary definitions, method of computation and metadata of indicators, including spatial indicators. It will include global, national and local monitoring to support the implementation of SDG Goal 11 targets. GAM will be encouraged to measure, monitor and report on the targets of SDG Goal 11 using a proposed framework that will entail enhancing their statistical capacities, and tapping into new and non-traditional data sources for spatial analysis.
  - Vision
  - Areas of Action and Priorities
  - Using indicators to monitor progress
- Improving municipal finance, creditworthiness and identifying priority for investment: This is discussed further at paragraph 45.
- Process for formulating and implementing the USF: The USF will be led by the leadership of GAM.




Source: GPSC, 2016

**FIGURE 2. Key components of the Urban Sustainability Framework.**

38. The technical assistance provided by the project will also develop a Financing Strategy (FS) for implementing the Sustainability Plan. The ability to mobilise resources to finance investments and interventions at the city level will be crucial for implementing the Sustainability Plan. Currently, GAM faces the daunting task of funding basic infrastructure and services to meet the needs of a rapidly growing

[15] The experiences of various cities in developing an action plan have revealed that the approach to formulating action plans have to be collaborative. It often requires the involvement of city leaders, relevant government bodies, multi-disciplinary team of specialists and consultants, key stakeholders and with inputs from the general public. Urban consultations with key stakeholders with guidance from expert working groups provide an excellent platform and method of distilling the key priorities that are relevant to the city and its people.

urban population compounded by the high influx of refugees, while also making capital investments for forward-looking projects. Opportunities for revenue generation are restricted by inadequate regulatory frameworks such as the outdated fiscal regime for municipal taxes. The GPSC will support participating cities to move towards fiscal and financial sustainability. Through leveraging the World Bank Group and other institutions' financial expertise and initiatives, such as Creditworthiness Initiative, the GPSC will provide support to enhance financial capacities in:

- Municipal financial management;
- Building investment options such as through city creditworthiness, municipal bonds, and PPPs; and
- Preparing bankable/investable projects based on the Sustainability Plan

Further, several outputs under Component 3 will directly support the implementation of the SP by leveraging financing (e.g. Outputs 3.2, 3.3 and 3.4) and putting in place a robust performance-based GHG monitoring framework (Output 3.1).

39. *Output 1.2: Quantification of all energy, water and material flows in the GAM*. As part of its commitment to pursuing sustainable development, the City of Amman is a member of the World Council on City Data (WCCD).[16] As a global leader on standardized metrics, the WCCD is implementing ISO 37120 Sustainable Development of Communities: Indicators for City Services and Quality of Life, the new international standard; created by cities, for cities. The WCCD has developed the first International Organization for Standardization (ISO) 37120 certification system and the Global Cities Registry™.[17] As part of a new series of International Standards being developed for a holistic and integrated approach to sustainable development and resilience in cities under ISO/TC 268, ISO 37120 establishes a set of standardized indicators that provide a uniform approach to what is measured, and how that measurement is to be undertaken.

40. ISO 37120 contains a total of 100 core and supporting indicators across the following attributes of a city: Economy (7 indicators), Education (7) Energy (7), Environment (8 indicators including GHG emissions), Finance (4), Fire & Emergency Response (6), Governance (6), Health (7), Recreation (2), Safety (5), Shelter (3), Solid Waste (10), Telecommunication & Innovation (3), Transportation (9), Urban Planning (4), Wastewater (5), and Water & Sanitation (7). On 7 December 2016, the City of Amman received the Platinum Certification from the WCCD for completing the ISO 37120 report for 2015.[18]

41. In conjunction with Output 1.3, the project will provide technical assistance to GAM for enhancing the quality of data reported to the WCCD using ISO 37120 for the following indicators: Energy, Water & Sanitation, and Solid Waste. The set of indicators have been limited in order not to stray too far from the overall objective of the project to reduce emission through EE and water efficiency in buildings. However, as noted above, the Sustainability Framework will propose a broader set of reference indicators (please see Annex SA2) for measuring the sustainability of GAM over time. Hence, GAM will be supported to also adopt any indicators that are relevant to the reference indicators related to energy, water and material flows that will be attached to the Sustainability Plan. All care will be exercised not to duplicate efforts, and a concise list of indicators relevant to sustainability planning, implementation, and monitoring and evaluation will be identified during the early stage of project implementation.

42. *Output 1.3: Institutional strengthening (Urban Planning Department and Amman Urban Observatory) for data analysis and reporting.* The Urban Planning Department (UPD) and the Amman Urban Observatory (AUO) are located in the GAM organisational structure. While the UPD is responsible for the physical development plan of GAM, and will play a central role in updating the Greater Amman Metropolitan

[16] http://en.smartiscity.eu/wccd-iso-37120-for-amman/ - accessed 27 December 2016.

[17] http://www.dataforcities.org/wccd/ - accessed 28 December 2016.

[18] The award is valid for one year, and a new report is due in 2017 for city data for the year 2016.

Growth Plan, the AUO is responsible for collating and analysing city data for reporting purposes. Currently, neither the UPD nor the AUO makes use a systematic Inventory Quality Management System (IQMS) for collating, analysing, reporting and archiving city data in formats that are needed to reporting against the ISO 37120. The project will provide support to the UPD and AUO to put in place the IQMS shown in **FIGURE 3**. The IQMS will be operationalised using Output 1.2, and the same Quality Management System (QMS) can be adopted for all other indicators that need to be reported under ISO 37120.

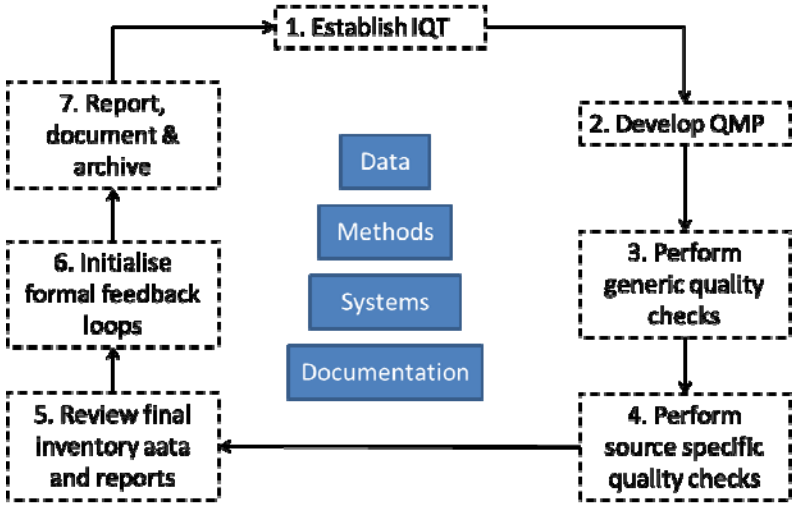



**FIGURE 3. Inventory Quality Management System.**

43. The Quality Control Framework (QCF) will be applied to the elements listed in **TABLE 3**.

**TABLE 3. Elements of Quality Control Framework and their attributes.**

| Elements of QCF | Attributes of elements of QCF |
|---|---|
| Data | • Raw data (e.g. activity level, emission factors etc.)<br>• Secondary data (e.g. sources and quality assurance systems used to generate data)<br>• Quality control procedures to carry out high quality data collection<br>• Improvements in data collection procedures |
| Methods | • Technical aspects of calculations and tools used for calculations (e.g. grid emission factor for national electricity system)<br>• Selection, application, and updating of inventory methodologies as identified by ISO 37120 and new research to improve data quality |
| Systems | • Institutional and managerial procedures for developing data inventories |
| Documentation | • Records of data, methods, systems, processes, assumptions and estimates |

44. The Quality Management System (QMS) will be managed using seven steps as summarised in **TABLE 4**.

**TABLE 4. Description of the seven steps to implement the QMS.**

| Step | Description |
|---|---|
| 1. Establish Inventory Quality Team (IQT) | • Responsible for implementing the QMS and to continually improve inventory quality<br>• Coordination between relevant units in GAM (e.g. 100 Resilient Cities), external entities providing secondary data (e.g. National |

| Step | Description |
|---|---|
| | Electricity Production Company for electricity and Miyahuna for water), and independent verifiers<br>• The IQT will be constituted using existing staff in AUO and will make use of GAM logistics and administrative support to run and administer the IQMS |
| 2. Develop Quality Management Plan (QMP) | • Outlining the steps taken by GAM to implement its QMS |
| 3. Perform generic checks | • Developing appropriate quality checks for all data and calculations to generate indicators |
| 4. Perform source-specific checks | • Developing guidelines for recalculation of indicators<br>• Establishing criteria / circumstances for data / indicators restatements<br>• Means of addressing uncertainty in data |
| 5. Review final inventory data and reports | • Establishing a process of internal technical review of data inventory, followed by a process of internal managerial review for institutional approval of inventory<br>• Establishing a process for external auditing of inventory data |
| 6. Institutionalise formal feedback loops | • Establishing a process of feeding the results of reviews in 5 to the IQT for the continuous updating of the QMP |
| 7. Report, document & archive | • Developing record keeping procedures, including how data is archived<br>• Establishing which information is kept for internal use and which information is reported to external parties<br>• Developing procedures for formal feedback |

45. *Output 1.4: Assessment and costing of awareness-raising campaigns for the Sustainability Plan.* For the successful implementation of the SP, stakeholders operating in GAM and the beneficiaries of the SP (e.g. households, businesses, public institutions etc .) must first be aware of the sustainability initiatives of GAM. The project will support GAM develop awareness-raising campaigns that will be differentiated to targets all the different beneficiaries and stakeholders in GAM. The process of developing the awareness campaigns will adopt the stakeholder engagement process described in Section 3.3.2. A gender-differentiated approach will be adopted by building on the Gender Analysis that was carried out during project design (please see Section 3.3.3 and **Annex SA6**). The design of the awareness-raising campaigns will be accompanied by a budget plan that will be used for financial resources mobilisation and/or internalising the cost of the awareness campaigns in the formal budgeting process of GAM.

### 3.1.2 Component 2: Strengthened GAM enabling framework for low-carbon buildings and street lighting

46. The expected outcome from outputs proposed in Component 2 is: "*the enabling conditions, methodologies and tools in GAM for enforcing regulatory frameworks for EE buildings and street lighting strengthened".*

47. This technical assistance component will address Barrier # 2 – *Lack of enabling conditions and tools for enforcing and enhancing regulatory frameworks (including financial incentives) for EE in the GAM*, and Barrier #4 – *Technical capacity barriers and absence of performance-based GHG monitoring frameworks and quality assurance*. It will specifically focus on helping strengthen the enabling conditions, methodologies and tools in the GAM for enforcing and enhancing the relevant regulatory frameworks for EE buildings and street lighting (as well as addressing technical capacity constraints). The outputs of Component 2 consist of:

Output 2.1: A new Sustainable Development Department (SDD) set-up within GAM.

Output 2.2: Enforcement capabilities of new Sustainable Development Department (SDD) strengthened as regards compliance with Energy Building Codes.
Output 2.3: Update of the existing Building Codes and development of a 'Retrofit Building Guidelines' to make upgrades more acceptable.
Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes.
Output 2.5: At least 5 ESCOs accredited and capacitated via programme.
Output 2.6: Development and dissemination of an online tool for carrying out comparative socio-economic and environmental analysis of buildings using life-cycle methodology.
Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates.

48. *Output 2.1: A new Sustainable Development Department (SDD) set-up within GAM*. After consultations with GAM management, a SDD is proposed to be set up within the GAM organisational structure as shown in **FIGURE 4**. The SDD could deal with cross-institutional issues related to Energy Efficiency (EE) and Renewable Energy (RE), and it is proposed to be established under the Licensing Directorate that is under the oversight of the Deputy City Manager, Planning & Economic Development. The SDD will serve the entire GAM structure regarding all sustainable development issues, including energy-related issues (e.g. renewable energy and energy efficiency). The SDD will initially host three sections, namely: (1) Sustainable Buildings; (2) renewable Energy; and (3) Administration.

49. For the purpose of the GEF-financed, UNDP-implemented project, the immediate task of the SDD would be to promote the update of EE in buildings, and in particular adoption of the Thermal Insulation Code in new buildings and Retrofit Guidelines for existing buildings. The SDD will be staffed using existing GAM human resources, and GAM management has given its commitment, through a Memorandum of Understanding (MoU) signed with the UNDP, to provide the SDD with all necessary logistics and administrative support. The Project Management Unit (PMU) will be based within the SDD.

50. Initially, the SDD will comprise three sections as follows:
1. Sustainable Buildings Section: It will include three divisions, namely: (1) Energy Efficiency Division; (2) Water Efficiency Division; and (3) Internal Environment Division;
2. Renewable Energy Section: It will have two divisions, namely: (1) Division of the Shams Capital Project; and (2) Solar Projects Licensing Division; and
3. Administration Section

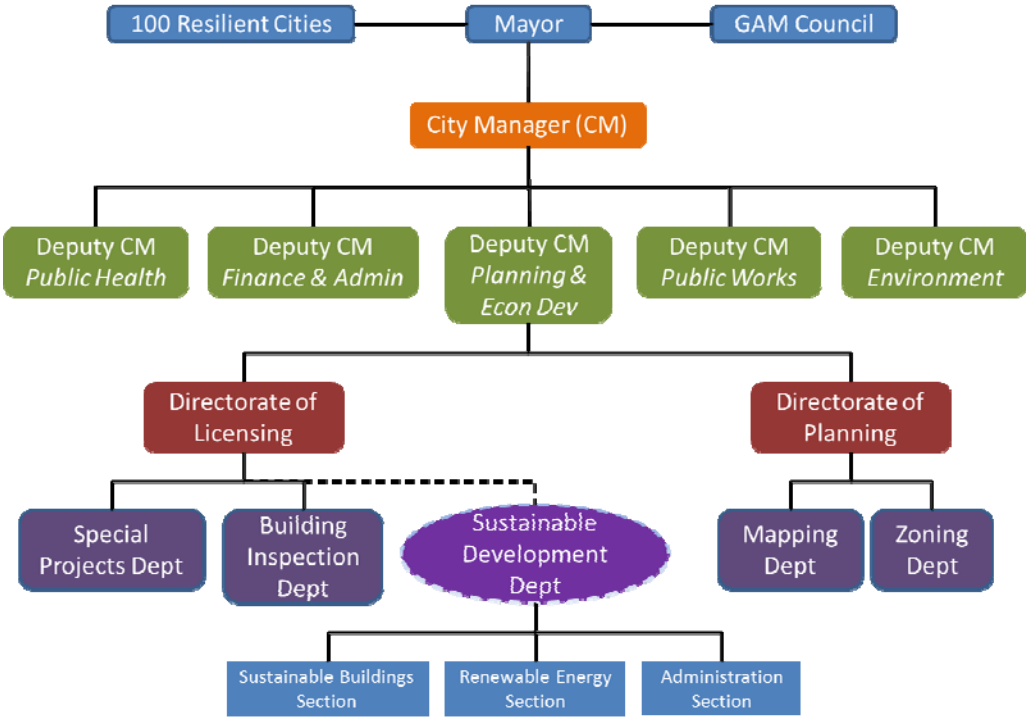



**FIGURE 4. Setting up of a Sustainable Development Department in GAM organizational structure.**

51. *Output 2.2: Enforcement capabilities of Sustainable Development Department strengthened as regards compliance with Energy Building Codes*. For achieving the objective of the project, the SSD will be provided with the necessary capacity building to support enforcement of the Thermal Insulation Code, and oversee the administration of GAM incentives (please see Output 3.3 below for more details) for promoting low-carbon buildings. The institutional structure for linking the enforcement of Building Energy Codes, and Building and Occupancy Permits is illustrated in **FIGURE 5**. The Jordan National Building Council (JNBC) has the made to develop and oversee the implementation of Buildings Codes. The structure shows the involvement of the Jordan Engineering Association (JEA) regarding the approval and verification of the civil, mechanical and electrical engineering aspects of buildings. Civil Defence is responsible to ensuring the application of the Safety Code and Fire Fighting Code in buildings. GAM issues a Building Permit when all building designs are according to these Codes, and it issues an Occupancy Permit building upon verification and certification from JEA and Civil Defence of the structural integrity and safety of the building, respectively.

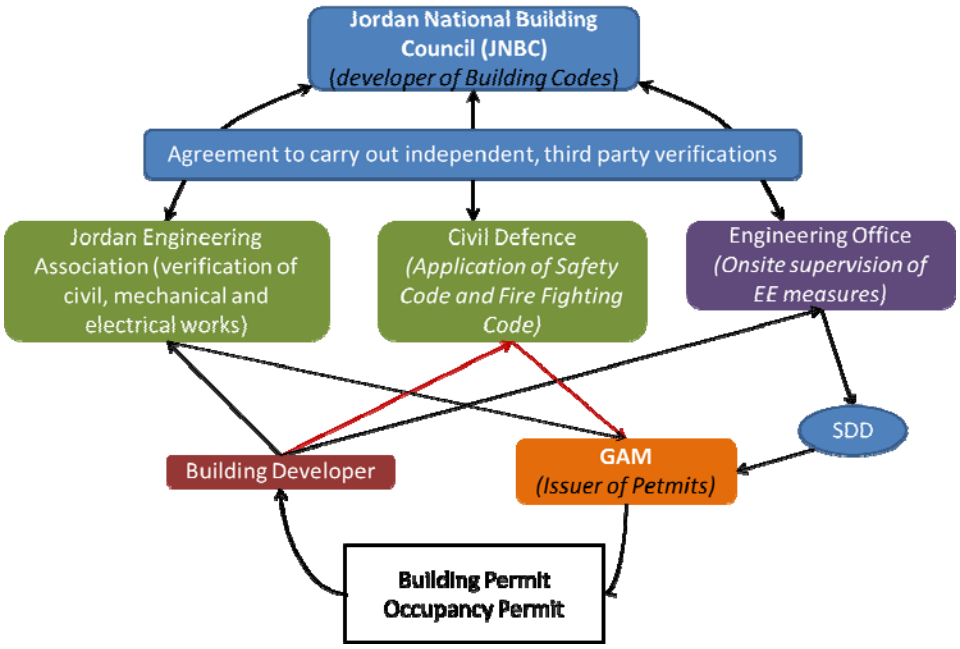



**FIGURE 5. Structure of the independent party verification of Building Codes.**

52. A similar approach is proposed for enforcing the Building Energy Codes, and in particular the thermal insulation of building envelopes. The proposed SDD will interact with the Engineering Office responsible for supervising the construction of the building in order to ensure that the energy-related aspects of the building design are respected according to the Building Codes. When necessary, the SDD may seek the technical support of the Royal Scientific Society (RSS).[19] The project will provide technical assistance to the SDD to strengthen its collaboration with the JNBC, Engineering Offices, and the RSS. An occupancy permit will be issued by GAM only after the SDD has received certification from the Engineering Office that the relevant Building Codes, and in the present case the Thermal Insulation Code, have been implemented.

53. The same institutional structure will also be used to issue a Certificate of Energy Performance under Output 2.7 and, in this case, by the RSS.

54. *Output 2.3: Update of the existing Building Codes and development of a 'Retrofit Building Guidelines' to make upgrades more acceptable.* From a regulatory perspective, there is a need to update the existing Building Energy Codes that is applicable to new buildings because some codes were developed a long time ago and are outdated. Further, since old buildings have 'locked in' inefficient technologies that will continue to have negative impacts over their relatively long lifetimes, the project will also develop 'Retrofit Energy Guidelines' in order to tap into the potentially large emission reductions in existing buildings. The project will provide technical assistance to the JNBC to update the existing Building Energy Codes, and for developing 'Retrofit Guidelines'. Attention will be given to country specific climate vulnerabilities coupled with the need for the harmonisation of Building Energy Codes in the League of Arab States (LAS). More specifically:

    1) *Current and future climate change and climate variability*:[20] Besides providing thermal comfort at reduced energy use in buildings, building envelope insulation provides the co-benefit of adapting to current and future climate change and climate variability. Future climatic changes are particularly

[19] An agreement is also ready in place for RSS to act as an independent verifier regarding the implementation of the Green Building Guide. A similar set up can be used for onsite verification regarding the implementation of the Thermal Insulation Code.

[20] Hashemite Kingdom of Jordan. (2014) Jordan's Third National Communication on Climate Change, pp. 121-127.

important given the long-life span of building and envelope insulation. Using a combination of dynamic and statistical downscaling of General Circulation Models (GCMs), the TNC has shown that it is extremely likely that the mean temperature for all of the country will increase by +1.2°C (+1.7°C) for RCP4.5 and +1.6°C (2.6°C) for RCP8 by 2035 (2055). The increase is predicted to be homogeneous for the RCP 4.5, and stronger for the Eastern and the Southern regions for RCP 8.5. Future dynamic projections predict *extremely likely* warmer summer compared to other seasons, as well as the *extremely likely* heat waves where the analysis of summer temperature, monthly values and the inter-annual variability reveal that some thresholds could be exceeded especially for a summer month where the average of maximum temperature for the whole country could exceed 42-44°C. Updating the Building Energy Codes, and especially the Thermal Insulation Code will have to take into account the projected increase in temperature; and

2) *Regional harmonisation of Codes*: Jordan is a member of both LAS and the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE). One of the objectives of LAS is to promote regional integration through the harmonisation of RE and EE policies and accompanying policy instruments such as Building Energy Codes. While providing technical assistance to the JNBG to update the Codes, the UNDP-GEF project will also support the process of regional harmonisation of Building Energy Codes in LAS.[21]

55. *Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes.* This output will be accomplished by building on the prior work carried out by USAID on developing a support system for Energy Service Providers (ESPs).[22] ESPs are accredited for installation and maintenance of energy efficiency appliances, equipment and fittings such as envelope thermal insulation and heating, ventilation and air conditioning (HVAC) or renewable energy generation such as roof-mounted solar PV for electricity generation or solar water heaters. ESPs do not invest and own (and operate where applicable) the equipment or fitting that is installed. The USAID-funded Energy Sector Capacity Building (ESCB) activity has been working since 2013 to strengthen the presence, capacity, and regulation of energy services providers (ESPs) through market research, business development services, ESP accreditation and the creation of a Coalition of Energy Services Associations (CESA). CESA is responsible for the accreditation of ESPs, and 15 companies that have received training under the project are currently being accredited.[23] The GEF-financed, UNDP-implemented project will extend the previous work of USAID by developing training and accreditation programme for ESCOs. Thereafter, the ESCOs will be able to bid for projects where they will invest in building thermal insulation and be paid by building owners on the performance of the thermal insulation in reducing the building energy bill.

56. *Output 2.5:* At least 5 ESCOs accredited and capacitated via programme. The project will draw from the pre-existing list of accredited ESPs to accredit up to 5 ESCOs. The accredited ESCOs will be provided with technical capacity building. The accredited ESCOs will be linked up with JREEF's initiative to use an ESCO model for developing new public-sector buildings that abide by the Building Energy Codes. The ESCOs will also benefit from financial de-risking instruments that the project will identify and quantify under Output 3.4. Further, the ESCOs will be linked to the EE Loan Product that the ESCB project has developed with Etihad Bank.[24]

57. *Output 2.6: Development and dissemination of an online tool for carrying out comparative socio-economic and environmental analysis of buildings using life-cycle methodology* the project will also develop and

[21] Hashemite Kingdom of Jordan, LAS, RCREEE, IEA, and EBRD. (2014) Energy Efficiency Policies for the SEMED-Arab Region - An Energy Efficiency Experts' Roundtable Report.

[22] http://escb-jordan.org/supporting-energy-service-providers/ - accessed 28 December 2016.

[23] Information provided by Mr Ramzi Sabella, Project Management Specialist, USAID on Wednesday 14 December 2016. The companies provide services related to installation and commissioning of PV; solar water heaters; heating, ventilation and air conditioning; and thermal insulation of building envelopes.

[24] Ibid.

disseminate an online tool for carrying out comparative socio-economic and environmental (GHG emission reduction) benefits analysis of Building Energy Code against the baseline situation, including outdoor lighting, using the life-cycle methodology. The tool will also cover the efficiency of outdoor lighting. It will be made available to investors, real estate developers, professionals (e.g. architects) and end-users. The tool will be used as for appraisal by investors; for green marketing by developers and professionals; and as a decision-making tool by end-users. A user-friendly interface will be designed to maximize the use of the online modeling tool by 'hiding' all the technical details of the calculations. With this interface, the tool can also be used as a pedagogical tool for teaching and training purposes. Further, once developed under Output 2.7, the rating and labeling system for the energy performance of buildings can be built in the online tool.

58. The design and development of the online tool can build on the prior work of the Jordan Green Building Council (JGBC) to develop an Excel-based electronic calculator under the USAID-financed We Smart project. The calculator provides the specific amount energy reduction that results from applying thermal insulation in a new or existing building, among others.[25]

59. *Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates*. For new buildings, the lack of incentives for compliance with existing legislation and lack of enforcement are the biggest issues. Building developers are motivated to abide by the Building Energy Codes in the presence of a rating and labeling system for the energy performance of buildings.[26] A similar proposal was echoed during a stakeholder meeting in Amman in April 2016 for analyzing barriers preventing the adoption of energy efficiency in buildings in the context of the energy-refugee nexus in Jordan. It was proposed that building energy ratings could provide a good incentive structure that would allow individual consumers to become more aware about efficiency targets, while cautioning that the certification would have to sit with an independent body of experts.[27] Technical assistance will be provided to JNBC for the development of a national energy rating and labeling for buildings. Further, the project will strengthen the institutional capacity of the RSS to act as an independent certification body to issue Energy Performance Certificate (EPC) based on the national energy rating and label for buildings. As mentioned earlier, the issuance of the EPC may be carried out using the structure illustrated in **FIGURE 5**. The design of the rating and labeling system for building energy performance could draw from or build on the recent work that has been carried out by the Jordan Green Building Council (JGBC) as described next.

60. As per Vision 2025 (see **Annex SA2**), all new buildings in the public sector comply with Leadership in Energy and Environmental Design (LEED). Jordan is in a good position to do this through technical assistance of the Jordan Green Building Council (JGBC). However, the implementation of LEED (or International LEED) has proved to be too cumbersome, and its adoption has remained poor. The JGBC has conducted a LEED Gap Analysis between the LEED rating system and what is available, appropriate, and feasible in Jordan. On a credit by credit basis within the five main components of energy, water, sustainable sites, materials & resources, and indoor environmental quality, these gaps have been outlined under consistent criteria and recommendations of feasible solutions to the implementation of credits or modifications to the credit requirements / intent proposed.[28]

61. Further, the JGBC has developed a Mini-Checklist, which is a simplified rating tool customized for both existing and new buildings in Jordan. The aim of developing the Mini-Checklist is to provide a voluntary

[25] The calculator also calculates the amount of the water wasted when the installation of a solar water heater is done incorrectly and when the heating unit is used incorrectly.

[26] Meeting with members of the Jordan Housing Developers Association on Tuesday 13 December 2016.

[27] G. Lahn, O. Garfham and A Elsayed Sparr. 2016. Refugees and Energy Resilience in Jordan: Moving Energy Initiative, Amman, 19-20 April 2016.

[28] JGBC. 2011. LEED Gap Analysis.

market driven simplified checklist that addresses the need of the residential apartment potential buyers for a more efficient building to live in, yet still have a positive effect on the environment. As a benchmark, the LEED categories have been taken as the platform to come up with the checklist items/clauses. The local Jordanian Building Codes and the Jordanian Green Building Guide have also been taken as a reference to make this solution-based system compliant with the existing local building codes and regulations.[29]

### 3.1.3 Component 3: Performance-based GHG monitoring frameworks for low-carbon building and street lights

62. The expected outcome from outputs proposed in Component 3 is: "*an integrated climate monitoring and finance framework is established for the development of urban NAMAs, and appropriate financial de-risking tools are identified and supported to promote adoption of EE measures in buildings attached to MRV systems".* This technical assistance component will address Barrier #3 - Information/Awareness and Perception Barriers about Resource Efficiency Benefits and Barrier #4 –Technical capacity barriers and absence of performance-based GHG monitoring frameworks and quality assurance, as well as support the identification of tools to mitigate Barrier #5 – Lack of fiscal incentives for uptake of EE building measures and proof-of-concept investments in the GAM. It will specifically focus on ensuring that an integrated climate monitoring and finance framework is established for the development of urban NAMAs and that the most appropriate financial de-risking tools are identified and supported to promote adoption of EE measures in buildings with accompanying MRV systems. The following outputs will be used to achieve the outcome of Component 3:

Output 3.1: Development of an urban MRV system for (i) Building Energy Codes and (ii) energy efficient street lighting for determination of emission reductions from investments.

Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plans for existing and new buildings, and street lighting

Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to promote investments in Building Energy Codes.

Output 3.4: Identification and quantification of the effectiveness of different policy and financial de-risking instruments for EE buildings using UNDP's de-risking methodology (DEEI).

Output 3.5: Lessons learnt, experiences and best practices related to the project are compiled and disseminated in other cities of Jordan and MENA countries.

63. *Output 3.1: Development of an urban MRV system for (i) Building Energy Codes and (ii) energy efficient lighting for determination of emission reductions from investments.* To monitor, report and verify (MRV) emission reductions provided by the targeted proof-of-concept investments in mitigation measures under Component 4, and the city-wide NAMA that will be developed under Output 3.2, standardised baselines for emission reduction calculations will be established. Energy is used directly in buildings in two forms, namely: (1) the use of grid electricity; and (2) combustion of fossil fuels for space and/or water heating. Standardised baselines for calculating emission reductions will be developed for both energy uses. In the case of grid electricity, a standardised baseline will be developed using the Clean Development Mechanism (CDM) Methodological Tool 07 – Tool to Determine the Emission Factor for an Electricity System (using the latest version of the tool).[30] This tool has been used in **Annex SA5** to estimate the grid emission factor of Jordan using power generation statistics for the years 2013, 2014 and 2015. However, due to unavailability of detailed power generation data for individual power units, the grid emission factor has used aggregate

[29] Taken from list of projects carried out by the JGBC as provided by Mr Ala'a Abdulla, Deputy Executive Director, JGBC on 18 December 2016. The JGBC has already registered 12 buildings through the voluntary application of the Mini-Checklist.

[30] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf - accessed 28 December 2016.

generation statistics at the power plant level. The calculation of the standardised grid emission factor will carry out using power unit-level generation statistics using the most recently available vintage year data. Regarding the combustion of fossil fuels for heating purposes, Tier 2 emission factors will be calculated for the City of Amman.

64. Grid electricity is also used for street lighting. So the standardised grid emission factor will also be used to calculate emission reductions accruing from the use of solar PV street and outdoor lighting and from the use of LEDs lights. A methodology will be developed for measuring and verifying the quantity of electricity used in street and outdoor lighting.

65. As discussed in Section 3.2 and **Annex SA5**, energy is also embodied in water used in buildings. Based on the approach proposed in this Project Document to determine the weighted average (by volume) embodied energy in buildings in GAM, a standardised baseline will be developed for calculating emission reductions emanating from a more efficient use of water in buildings.

66. An MRV system will also be established for these standardised baselines to quantify GHG emission reductions accruing from the project activities. It will also support the tracking of the emission reduction performance of the NAMAs that will be developed under Output 3.2. The urban MRV system will also identify the institutions that will be responsible for measuring and providing quality assurance for the data required to calculate emission reductions and for developing and updating emission factors.

67. *Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plans for existing and new buildings, and street lighting*. This output supports the national process for preparing NAMAs that will develop and implement a replication and scaling-up plan for EE buildings (new and existing) and street lighting in GAM. As discussed in Section 4.4, the lessons learned from the project have the potential to extend the NAMAs to other large cities in Jordan. The NAMA Tool developed by the GIZ can be used for developing the NAMAs.[31] Since the proof-of-concept investments that will be implemented under Component 4 will support the development of the 2 city-wide NAMAs, and since MRV systems are cornerstones of NAMAs, it is proposed that the urban MRV system that will be developed under output 3.1 should also contain a MRV for tracking the sustainable development impacts of the NAMAs that will be additional to measuring their climate change impacts (i.e. measuring GHG emission reductions).

68. *Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to promote investments in Building Energy Codes.* One of the greatest challenges to increasing adoption of renewable energy and energy efficiency practices is identifying financing sources. ESCB has conducted extensive research and networking with public and private financing institutions, including banks, to identify financing opportunities for both large and small-scale energy improvements. ESCB has worked with Etihad bank to provide EE loan products to accredited SEPs. In collaboration with the Sustainable Energy and Economic Development (SEED) project implemented by Cowater International (see Section 3.3.1 and Annex SA2 for details), the UNDP-GEF project will assist JREEEF to develop its post-2020 action plan with customized financial instruments, including delivery model, for promoting Building Energy Codes. The identification of the most appropriate instruments will emanate from the quantification of the effectiveness of the policy and financial de-risking instruments that will be carried out under Output 3.4.

69. *Output 3.4: Identification and quantification of the effectiveness of different policy and financial de-risking instruments for EE buildings using UNDP's de-risking methodology (DEEI)*. One of the recommendations emanating from the review of JREEEF and JEF during the formulation of the National Green Growth Plan

[31] GIZ. 2016. *Nationally Appropriate Mitigation Actions (NAMAs): Steps for morning a NAMA from idea towards implementation*.

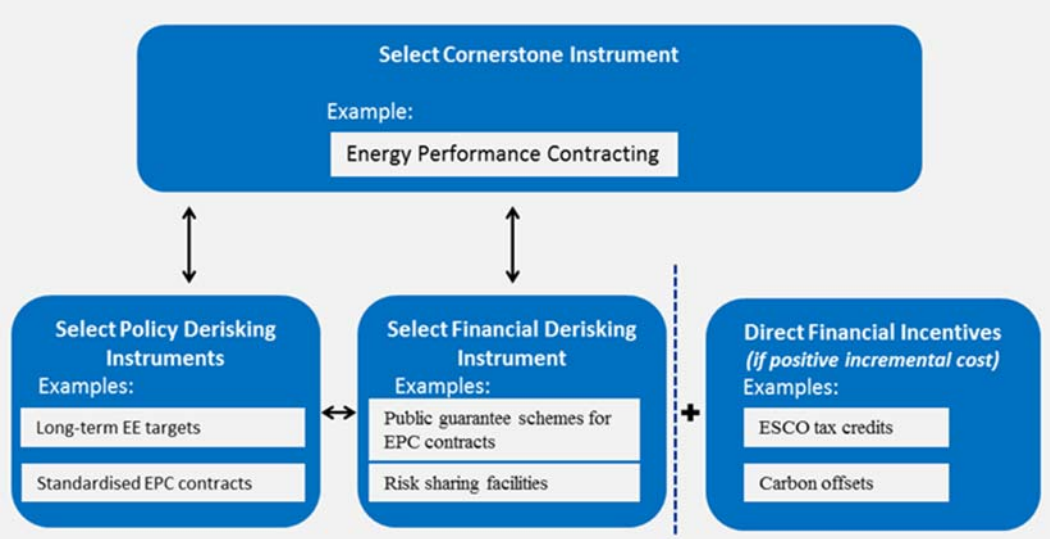
(NGGP) is to conduct structured risk analysis and de-risking study for private finance. In 2013, UNDP issued the De-risking Renewable Energy Investment report (the "DREI report")[32]. The DREI report introduced an innovative methodology (the "DREI methodology") with an accompanying financial tool in Microsoft Excel, to quantitatively compare the cost-effectiveness of different public instruments in promoting renewable energy investment. More recently, the DREI methodology has been used to design and develop GEF-financed, UNDP-implemented climate change mitigation projects in Tunisia[33] and Nigeria[34]

70. Based on the successful application of DREI, UNDP is currently extending the de-risking approach to energy efficiency in buildings – i.e. De-risking Energy Efficiency Investment (DEEI). The DEEI methodology will be applicable to ESCOs operating on an Energy Performance Contracting modality. In this case, the ESCO investing in EE equipment (e.g. HVAC or central heating) or measures (e.g. building envelope thermal insulation) is expected to adopt a project financing scheme combining debt and equity financing. In early-stage ESCO markets (like in Jordan), private investors face high financing costs (both for equity and debt). These high financing costs reflect a range of technical, regulatory, financial and technological barriers and their associated investment risks. Investors, therefore, require a high rate of return to compensate for these risks. In seeking to create an enabled environment for private sector energy efficiency investment, policy-makers typically implement a package of public instruments. From a financial perspective, the public instrument package aims to achieve a risk-return profile for energy efficiency in buildings that can cost-effectively attract private sector capital. **FIGURE 6** identifies the four key components of a public instrument package that can address this risk-return profile. The cornerstone instrument is the centrepiece of any public instrument package. For energy efficiency investments in buildings using an ESCO model, the cornerstone instrument is typically a tendering process which allows the private investor to enter into long-term (e.g. 15-20 year) agreement with the building owner for delivering energy savings – i.e. Energy Performance Contracting (EPC) modality. The cornerstone instrument can then be complemented by three core types of public instruments, namely: (1) instruments that reduce risk – i.e. policy de-risking instruments; (2) instruments that transfer risk – i.e. financial de-risking instruments; and (3) instruments that compensate for risk – i.e. direct financial incentives. More details about the DEEI methodology is given in **Annex SA3**.

[32] Waissbein, O., Glemarec, Y., Bayraktar, H., & Schmidt, T.S., (2013). *Derisking Energy Investment: A Framework to Support Policymakers in Selecting Public Instruments to Promote Renewable Energy Investment in Developing Countries.* New York, NY: United Nations Development Programme.

[33] UNDP (2014). *Tunisia: Derisking Renewable Energy Investment*. New York, NY: United Nations Development Programme.

[34] UNDP (2015). *Derisking Renewable Energy NAMA for the Nigerian Power Sector – Project Document*: https://www.thegef.org/sites/default/files/project_documents/ID5345_-_CCM_-_Nigeria_-_Derisking_Renewable_Energy_NAMA_for_the_Nigerian_Power_Sector_-_ProDoc_-_final_0.pdf - accessed 1 March 2017.




Source: Adapted from Waissbein et al. 2013

**FIGURE 6. Typical components of a public instrument package for energy efficiency using an ESCO model.**

71. The DEEI methodology will be applied in four stages at the beginning of project implementation, namely: (1) Stage 1 - Risk Environment; (2) Stage 2 – Public Instruments; (3) Stage 3 – Financial Analysis; and (4) Stage 4 – Evaluation. Section SA3.2 of Annex SA3 provides details regarding the application of the four steps, including the methodological approach and tools that will be used during each stage. Examples that are motivated from the application of DREI have been used to illustrate the results that are expected from each stage of the DEEI methodology.

72. *Output 3.5: Lessons learnt, experiences and best practices related to the project are compiled and disseminated in other cities of Jordan and MENA countries.* A lesson learned report will be developed to capture best practices related to the project for dissemination (website, publications, manuals, participation in national, regional and international conferences and fora etc.), and to demonstrate the process for leveraging private investments in EE buildings and climate finance (through the development of a city-wide NAMA in GAM that can be extended to other major cities in Jordan) using a risk-adjusted approach.

### 3.1.4 Component 4: Targeted proof-of-concept mitigation interventions

73. The expected outcome from outputs proposed in Component 4 is: "*selected proof-of-concept mitigation interventions".* Outcome 4 will support concrete, on-the-ground activities that promote thermal insulation in new and existing buildings. This investment component will build on the TA-funded activities supported under Components 1-3 and provide targeted cost-sharing GEF support for selected proof-of-concept EE investments in the GAM. It will address Barrier #5 – *Lack of fiscal incentives for uptake of EE building measures and proof-of-concept investments in the GAM.*

74. Financial support is necessary to showcase the efficacy and viability of the building codes and jump-start the retrofit market, in certain cases addressing issues of affordability for the upfront cost of new low-carbon features or EE retrofits; in other cases, to improve the IRR of EE retrofit projects; and in other cases, as a behavioral incentive to stimulate the initial demand from building owners. In order to showcase low-carbon buildings in the GAM and the show "proof of concept" examples of what can be done to reduce resource consumption in the built environment, GEF financing will be used as complementary grant co-financing to leverage GAM and JREEF finance and other funding sources (private sector) for implementation of best-practice EE building measures in new and existing buildings, and street lighting using standalone solar PV in combination with LED (light emitting diode) lighting.

75. Because of the lack of enforcement and the lack of incentives to abide by the Building Energy Codes, the prevailing practice is that the Thermal Insulation Code is not implemented in GAM. Consequently, the new buildings in GAM are poorly insulated. In the absence of the UNDP-GEF project, this situation will continue and the development of low-carbon buildings will not happen or be delayed at best. It is pointed out that the implementation of Component 4 will require the prior completion of the outputs under Components 2 and 3, and the sequencing of activities have been taken into account in the design of the Multi Year Work Plan (MYWP) shown in **Annex 1**. For instance, the SDD (output 21.) and its enforcement capabilities (output 2.2), as well as updates to Building Codes (output 2.3) will need to be completed before Outputs 4.1 and 4.2 can be implemented. The same applies to the accreditation of ESCOs (output 2.4 and 2.5) that are expected to carry out the installation of building insulation, and the development of an energy rating and label for buildings that are insulated according to the Thermal Insulation Code (output 2.7). The development of the MRV system proposed under output 3.1 for monitoring the emission reductions that accrue from applying the Thermal Insulation Code need to be completed before the thermally-insulated new or retrofitted old buildings are commissioned. The same approach will be used for tracking the performance and emission reductions emanating from street lighting using solar PV.

76. The proposed outputs of Component 4 consist of:

Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported.
Output 4.2: 4 existing public-sector buildings integrating best practice resource efficient/technology measures supported.
Output 4.3: Updated EE Lighting Code and smart usage system in place for all GAM lights.
Output 4.4: Stand-alone PV street lighting installed in GAM using the most energy efficient and site appropriate lighting technology available (e.g. LEDs)

77. *Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported*.
Most buildings in GAM are constructed by the private sector. About 90% of all buildings are used for residential purposes and the remaining 10% mainly for commercial purposes. Two private-sector residential buildings have been chosen with the support of the Jordan Housing Developers Association (JHDA).

One of the new buildings (New Building 1) will be constructed in north or western districts of Amman. The residential building will consist of 4 floors and 2 basements, with the lower one used as car park. The floor area will be about 330 $m^2$ (22 m x 15 m and 3 m high) with 2 apartments on each floor and with a stair case and elevator in the middle. Each apartment will have 3 bedrooms (one of which is the master bedroom), one kitchen, one living and reception area, two bathrooms, and a balcony. As discussed in paragraph 74, the conventional building practice would be applied in the absence of the GEF investments. Under the prevailing practice, the building will be constructed from stone and concrete, and it is anticipated that no thermal insulation will be used and the ordinary sliding aluminum single-glazed windows will be used.

The second new building (New Building 2) will also be for residential purpose, and it will have similar dimensions as the one described above. The only difference is that the second building will be poorly insulated as per the prevailing practice (e.g. ~3-5 cm expanded polystyrene) and double-glazed windows. In both cases the insulation will be inferior to the Thermal Insulation Code.

The construction method will be as follows: building the core of the envelope with stone (3-5 cm thick from outside) and bricks (10 cm hallow from inside). Although no central heating system will be installed, the internal (inside the apartment) piping or sleeves will be laid under the tiles for possible future installation of central heating system. Each apartment will be occupied by one family.[35] Under the prevailing practice, the

[35] The average family size is 4.8 in Jordan (http://www.jordantimes.com/news/local/population-grew-87-over-decade-%E2%80%94-census – accessed 30 August 2017).

gap between the external and internal walls will be filled with concrete, but this practice will not be applied under the UNDP-GEF project interventions. The gap will be used to apply thermal insulation according to the Thermal Insulation Code. Similarly, all windows will be insulated using insulated material as frame and double-glazed according to the Code. Water efficient fixtures will also be installed in the new buildings.

The interventions that the UNDP-GEF project will invest in to enhance the projects are summarized in **TABLE 5**.

**TABLE 5. Interventions in new buildings.**

| Buildings | Area of building envelope to insulate ($m^2$) per apartment | Number of openings to upgrade per apartment | Number of water efficient fixtures to upgrade per apartment |
|---|---|---|---|
| New Building 1 | 100 (façade) + [one roof of 330 $m^2$] | 5 (window size = 2 $m^2$) | 4 (flow mixer and restrictors) & 1 dual-flush toilet |
| New Building 2 | 90 (façade) + [one roof of 275 $m^2$] | 5 (window size = 2 $m^2$) | 4 (flow mixer and restrictors) & 1 dual-flush toilet |

78. *Output 4.2:* 4 *existing public-sector buildings integrating best practice resource efficient/technology measures supported.*

The project will retrofit four buildings of strategic importance in GAM. The thermal efficiency of these buildings will not be improved in the absence of the GEF investments. As landmark and highly visible buildings, retrofitting these buildings will provide very high visibility for the project, and also for demonstrating the tangible benefits to the GAM population regarding low-carbon buildings.

First, thermal insulation and water efficient fixtures will be retrofitted in the **Basman District Headquarter**, which is open to the general public six days a week. This building is owned and managed by GAM, and it hosts 40-50 visitors per day who come for administrative purposes, including application of building and occupancy permits and to report and deal with complaints regarding municipal services. The Headquarter of Basman District is located in Al-Hashmi, East Amman. This district is one of 22 districts forming GAM and serving one of the most heavily populated areas, which include Jabal Nuzah, Jabal Qusoor, Almahatah, Alaqsa, Jabal Al-Hashmi and Wadi Hadadeh.

The building was constructed in 1989. It consists of two floors, each with a total an area of 440 $m^2$ (L=26 m, W=17, H=3), with the entrance facing south and its envelope has no thermal insulation and eastern and western external walls are made of hard stone (from outside) and concrete and plaster layer on the inside, with a total thickness of about 30 cm. The two remaining walls (north and south) are made of concert and plaster on both sides with a total thickness of 25 cm. There is a small public library for the local community behind the main building.

The main entrance is made of 10 mm glass with no frame and kept open during summer, but in winter closed by a mechanical device fixed to the floor. The windows are made of aluminum frame and single-glazed 6 mm thick, old sliding type with high infiltration rate. The building is heated by a central heating system firing diesel fuel during winter, but there is no domestic water heating. There are 12 AC units (5x2 ton, 5x1.5 ton and 2x1 ton) used for space heating and cooling and all are controlled manually. The design of existing windows is not effective since it covers high percentage of external walls.

79. **Old residential building** - Another intervention of strategic importance, especially in the context of providing low-cost housing to the population and Syrian refugees in GAM, is the ability to demonstrate

the cost effectiveness and efficiency of applying EE in low-cost housing. This is a critical issue since low-income households spend disproportionately more disposable income on heating during winter than other income groups. The ability to reduce the energy bill of low-income households will have strong social benefits. Consequently, the project will invest in the retrofitting of a typical low-income residential complex. The measures will include the application of building envelope thermal insulation, EE fenestration and water efficient devices. The residential complex is an old building that was built in 1979-80 without thermal insulation and having old aluminium single-glazed windows. It consists of three floors (~140 $m^2$ per floor) and two apartments per floor. The residential complex has high visibility as it is located on a main road and in proximity to a Mosque.. Each apartment will be occupied by one family.

80. **Ministry of Industry and Trade (MoIT) building** - The Government of Jordan has taken a leadership role in terms of enhancing EE in public buildings as per NEEAP 2013. A baseline EE study was carried out through USAID technical assistance for six ministries.[36] All while acknowledging that none of the 6 buildings had wall insulation and all windows were in aluminium frame and single-glazed,[37] the focus of the action plan was mainly on improving the efficiency of electrical appliances. Only two actions were related to building insulation, and of limited scope. The two actions related to thermal insulation are actions O.2 (pg 20 Ministry of Industry and Trade) and AC.3 (pg 16, MEMR). In both cases, the expected energy savings are very small, representing less than 1% of total savings in the case of O.2. Using an incremental approach, the UNDP-GEF project will support the Ministry of Industry and Trade (MoIT) to scale up the insulation of its building.

81. The MoIT building situated at Asharief Alradi Street, Shumisani, Amman has a total floor area of about 22,000 $m^2$, and each floor consists of three wings. The buildings were built in early 1970s and are not insulated. One diesel-fired boiler is used to supply hot water to the air handling unit of the ground floor (Public Service Office). The central heating system is not used for space heating on other floors. The main sources of heating are split air conditioners (320 units that are also used for cooling in summer) and package units. The average daily number of visitors is estimated between 1000 and 1500.[38] Details of the three buildings that will be involved in the proof-of-concept component of the UNDP-GEF project are listed in **TABLE 6**.

**TABLE 6. Characteristic of MoIT buildings benefiting from retrofits.**

| Building | Characteristics |
|---|---|
| Building 1 | Is used as offices and consists of four floors and one basement with a total area of 4,675 $m^2$, 50 $m^2$ stair-cases and an additional prefabricated floor on the top with an area of 210 $m^2$. The external walls are made of thick hard stone (10 cm), concrete (15 cm) and 2-3 cm plaster layer on the inside wall. The roof is not insulated.<br>All windows are ordinary sliding Aluminum frame and single glazed (U=5.6 W\$m^2$ C), with a transparent glass of 6 mm thick and rubber seal belt and fine plastic brushes are used as wind infiltration sealants. The total area of the building envelop is about 1,500 $m^2$ and each floor has 16 windows (1.50 mx1.25 m). Each floor has two washing rooms, one for men (three urinals, three toilets and two washing basins) and the other for women (two toilets and two washing basins). All toilets are equipped with a single flush system and no water restriction devices are used for washing basins. |
| Building 2 | Is used as offices and consists of four floors and two basements (for car parking) with a total area of 6,930 $m^2$, 50 $m^2$ stair-cases and an additional prefabricated floor on the top roof. The external walls are the same as for Building 1. The roof is not insulated. |

[36] USAID (2016). *Energy Saving Action Planning for Government Buildings in Jordan: Energy Auditing and Capacity Building for Six Ministries in Jordan*.

[37] Ibid, pg.13.

[38] The lower value is used to account for the number of beneficiaries in the Results Framework in section 5.

| Building | Characteristics |
|---|---|
| | All windows are similar as in Building 1. The total area of the building envelop is about 1,650 $m^2$ and each floor has 17 windows (1.50x1.25 $m^2$). The washing room configurations, including type water devices used are the same as in Building 1. |
| Building 3 | This is the main building and it is used as offices and consists of five floors and one basement with a total area of 3,050 $m^2$ and 50 $m^2$ stair-cases. It has similar external walls, roof and windows as the previous buildings.<br>The total area of the building envelop is about 1,550 $m^2$ and each floor has 15 windows (1.50mx1.25 m). Other windows are opened on the main shaft. The washing room configurations, including type water devices used are the same as in Building 1. In addition, there are private toilets for the minister, secretary general, companies' controller, and insurance controller, all of which are single-flush type toilets.<br>There is a one-stop-shop (public office) covering an area of about 574 $m^2$. This is an open space and was renovated recently, including the installation of new PVC windows and AC system. |

82. **Water, Energy and Environment Centre (WEEC) building** – The WEEC forms part of the University of Jordan campus. It is built on the roof of the Faculty of Agriculture, with a total area of 380 $m^2$ (comprising 4 laboratories, 15 offices and 2 meetings rooms). On the roof there are two small laboratories and the final ceiling is covered with bitumen to prevent water penetration and dampness. There is a false-ceiling inside with an air-gap of about 45 cm. The building was constructed about 25 years ago and its envelope is not insulated. The external walls are made of hard thick white stone and concrete with an average thickness of about 30 cm. The 31 windows are typical old sliding aluminium frame, single-glazed with an average area of about 1.5 x 2.5 $m^2$. The main door is made of aluminium frame, single glazed and has high infiltration rate. There are 19 water points in the center, and the toilets are equipped with old and large-sized single flush nigari.

WEEC has 25 employees. MSc students registered in water and environmental courses take lectures in the centre. Also, short training courses in the field of water, energy and environment are offered by WEEC. The total number of beneficiaries is estimated to be around 2000 visitors and students per year.

83. The interventions proposed for retrofitting the above four existing buildings in order to enhance thermal insulation and water efficiency are summarised in **TABLE 7**.

**TABLE 7. Summary of interventions in existing buildings.**

| Buildings | Area of building envelope to insulate ($m^2$) | Number of openings to upgrade | Number of water efficient fixtures to upgrade |
|---|---|---|---|
| GAM Basman District building | 440 $m^2$ (roof)<br>&<br>446 $m^2$ (façade) | • 8 hinged windows (2mx0.5m)<br>• 6 medium sliding windows (2mx1.25m)<br>• 5 large sliding openings (3mx1m)<br>• 4 large sliding openings (4mx1m)<br>• 2 large sliding openings (8mx1m)<br>• Adding air curtain or | 10 (flow mixer and restrictors) & 13 flush toilet/tanks |

| Buildings | Area of building envelope to insulate ($m^2$) | Number of openings to upgrade | Number of water efficient fixtures to upgrade |
|---|---|---|---|
| | | rotating door for the entrance | |
| Old Residential building | 140 $m^2$ (roof) & 134 $m^2$ (façade) | 5 openings each of 2 $m^2$ | Six times [4 (flow mixer and restrictors) & 1 flush toilet/tank] |
| MoIT building | Building 1: 935 $m^2$ (roof) & 1,470 $m^2$ (façade); Building 2: 1,155 $m^2$ (roof) & 1,620 $m^2$ (façade); Building 3: 610 $m^2$ (roof) & 1,522 $m^2$ (façade); | Building 1: 16 windows (1.5m x 1.25m) Building 2: 17 windows (1.5m x 1.25m); Building 3: 15 windows (1.5m x 1.25m) | Building 1: 4 X [7 flow mixer and restrictors) & 5 flushed toilets/tanks]; Building 2: 4 X [7 flow mixer and restrictors) & 5 flushed toilets/tanks]; Building 3: 5 X [7 flow mixer and restrictors) & 5 flushed toilets/tanks] + additional 4 flushed toilets for private use; |
| WEEC building | 380 $m^2$ (roof) & ~136 $m^2$ (façade) | 30 windows with a total area of 102 $m^2$ & 1 door with an area of 1.8 $m^2$ | 15 (flow mixer and restrictors) & 4 flush toilets/tanks |

84. *Output 4.3: Updated EE Lighting Code and smart usage system in place for all GAM lights.* GAM has already embarked on a project for replacing all street lights, which are predominantly mercury vapour lamps, with LED. GAM has signed an agreement with the Khaled Bin Alwaleed Investment Group for the retrofitting of 119,000 LED lights.[39] Further, the European Bank for Reconstruction and Development (EBRD) is providing a senior loan for the supply, installation, operation and maintenance of 110,000 new energy efficient LED street lights in two phases.[40]

85. Based on the advice from GAM management, no investments will be made by the UNDP-GEF project for replacing street lights. However, there is no code for outdoor lighting using LEDs. To support the initiative of replacing all street lights with LEDs, technical assistance will be provided to GAM for the technical specification of a code for carrying out such lighting. Further, technical assistance will be provided to the Jordan Standards and Metrology Organisation (JSMO) for developing a national standard for LEDs used for outdoor lighting. This is important since the LEDs will be manufactured locally, and having a national standard is required to ensure that the LEDs are up to required standards. The standards will be based on the European norms that will allow Jordan to also export LEDs.

86. *Output 4.4: Stand-alone PV street lighting installed in GAM using the most energy efficient and site appropriate lighting technology available (e.g. LEDs).* The replacement of mercury vapour lamps with LEDs will be powered using grid electricity that has an emission factor equal to 0.5642 $tCO_{2e}$/MWh as calculated in **Annex SA5**. In order to increase the global environmental benefits, the project will support investments in standalone solar PV lighting that will use the LEDs that will be deployed by GAM as explained in the previous paragraph. The PV-powered lighting will be carried on both primary and secondary roads, as well as for lighting public and open spaces in the vicinity of the existing buildings in Output 4.2. The street lighting systems will have the specifications given in **TABLE 8**. The system sizing is designed for providing

[39] http://www.jordantimes.com/news/local/gam-signs-deal-replace-119000-street-lights-led-units - accessed 24 October 2017.

[40] Information obtained from Eng. Nisreen Alaraj, Mayor's Advisor for Projects, GAM in a meeting on 10 October 2017. Please also see www.ebrdbusiness.com.tw/admin/DownLoad/DownLoadFile.ashx?sid=83 – accessed 24 October 2017.

approximately 2 days of backup power to cater for variances in solar insolation. Each standalone setup will have a built-in dusk to dawn sensor, a built-in battery charge controller, and the pole height will be 5 m.

**TABLE 8. Specifications for solar-powered street and outdoor lighting in GAM.**

| Location | LED rating (W) | PV capacity (Wp) | Battery size (AH) | Number of units |
|---|---|---|---|---|
| Basman District Building (outdoor premises) | 12 | 50 | 40 (12 V controller) | 30 |
| MOIT | 12 | 50 | 40 (12 V controller) | 70 |
| Old residential building | 12 | 50 | 40 (12 V controller) | 5 |
| WEEC | 12 | 50 | 40 (12 V controller) | 15 |
| Secondary roads | 18 | 75 | 60 (12 V controller) | 200 |
| Primary roads | 24 | 100 | 75 (20 V controller) | 250 |

## 3.2 Global Environmental Benefits

87. The project will enable GHG emission reductions in three ways, namely through the reduction of: (1) electricity needed for space cooling; (2) fossil fuel combustibles used for space heating; and (3) water used in buildings that has a high embodied energy. Each one of the three sources of emission reductions will take place in existing and new buildings. The GHG emission reductions discussed below will accrue at the end of the 5-year project, and will emanate from the targeted proof-of-concept EE measures that will be implemented under Component 4 of the project.

88. The grid emission factor of Jordan has been estimated in order to calculate the GHG emission reductions arising from the reduction in electricity needed for space cooling because of thermally-insulated building envelopes. For this, the CDM Methodological Tool 07 – Tool to calculate the emission factor of an electricity system – Version 05.0 has been used.[41] Using power generation statistical data for 2013, 2014 and 2015, the combined margin grid emission factor has been calculated as 0.5642 $tCO_2$/MWh. The detailed calculation is given in **Annex SA5**. As discussed in Section 3.1.3, and more specifically related to Output 3.1, the grid emission factor can be developed in more details during project implementation as a standardised baseline within the broader MRV system that the project will develop and operationalize.

89. The Water-Energy nexus is an important one in Jordan, and especially in Amman that hosts the largest fraction of the total country population and wherein water is transported over long distances. A notable example is the Disi-Amman Water Conveyor System that pumps around 100 $Mm^3$ of water from the Disi-Mudawwara aquifer to Amman over a 325-km pipeline. Water is pumped in two stages before storage in the Abu Alanda (~40%) and Dabouq (~60%) reservoirs. The total elevation differential over which water is lifted by during the two pumping stages in ~800 m. The end result is a relatively high embodied energy of ~4 kWh/$m^3$ of water pumped and transported from Disi.[42] Another example of high energy embodied in water supplied in Amman is water pumped through the Zai Conveyance System between Deir Ala and Amman. In this case, water is pumped through an elevation differential of ~1,100 m.[43]

[41] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v5.0.pdf - accessed 23 January 2019.

[42] For details, please see: https://en.wikipedia.org/wiki/Disi_Water_Conveyance; https://www.opic.gov/sites/default/files/docs/disi_water_psc_insurance.pdf - accessed 23 January 2017.

[43] Please see: https://www.jica.go.jp/jordan/english/activities/pdf/activity_01.pdf - accessed 23 January 2017.

90. Using data obtained from Miyahuna for the volume ($m^3$) and specific energy ($kWh/m^3$) of water supplied to Amman from different sources, the volume-weighted specific energy of water supplied to buildings in GAM has been calculated as 2.248 $kWh/m^3$ as shown in **Annex SA5**. By applying the grid emission factor given above, the embodied carbon dioxide in water delivered to buildings in Amman is 1.27 $kgCO_2/m^3$ of water. This shows that improving water efficiency in buildings leads directly to a reduction of 1.27 kg of $CO_2$ for each cubic metre of water that is saved. The overall emission reduction is ~12% more per $m^3$ of water saved when water supply loss due to leakages is taken into account.[44] In this case, saving one cubic metre of water through end-use efficiency measures results in 1.42 $kgCO_2$ of emission reduction.

91. GHG emission reductions accrue from two sources, namely: (1) through the demonstration projects that absorb the GEF investments under Component 4 of the project; and (2) through updating and enforcing the Thermal Insulation Code under Component 2 of the project. The proof-of-concept interventions take place in both existing and new buildings. Concerning the enforcement of the Thermal Insulation Code, the calculations have been carried our separately for residential, public and commercial buildings, and by assuming that there will be a doubling of the new area built that abide by the Building Code by 2022 compared to their respective values in the baseline. The following discuss the emission reductions accruing from proof-of-concept (demonstration) projects and enforcement of the Thermal Insulation Code in turn.

92. Proof-of-concept in existing buildings: The annual GHG emission reductions accruing from applying thermal insulation in existing buildings is summarised in **TABLE 9**. Application of thermal insulation results in the reduction of both diesel used for space heating and electricity used for either cooling or heating. The results shown in **TABLE 9** are the combination of emission reductions from these two sources, with the breakdown given in **Annex SA5**. Please note that the interventions that will lead to the emission reductions are detailed in section 3.1.4.

**TABLE 9. GHG emission reductions from the retrofitting of existing buildings.**

| | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|
| GAM Basman District building | 0.0 | 9.7 | 19.3 | 19.3 | 19.3 |
| Old Residential building | 0.0 | 25.1 | 50.3 | 50.3 | 50.3 |
| Ministry of Industry and Trade (MOIT) building | 0.0 | 0.0 | 170.7 | 341.5 | 341.5 |
| Water Energy and Environment Centre (WEEC) building | 0.0 | 17.3 | 34.7 | 34.7 | 34.7 |
| ***Carbon dioxide equivalent, $tCO_2e$*** | ***0.0*** | ***52.1*** | ***275.0*** | ***445.8*** | ***445.8*** |
| **Cumulative emission reductions, $tCO_2e$** | **0.0** | **52.1** | **327.2** | **773.0** | **1,218.8** |

93. Proof-of-concept in new buildings: The annual GHG emission reductions accruing from applying thermal insulation in new buildings is summarised in **TABLE 10**, with the detailed calculations given in **Annex SA5**.

**TABLE 10. GHG emission reductions from new private residential buildings.**

| | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|
| New Building 1 | 0.0 | 0.0 | 78.4 | 78.4 | 78.4 |
| New Building 2 | 0.0 | 0.0 | 20.0 | 20.0 | 20.0 |
| ***Carbon dioxide equivalent, $tCO_2e$*** | ***0.0*** | ***0.0*** | ***98.4*** | ***98.4*** | ***98.4*** |
| **Cumulative emission reductions, $tCO_2e$** | **0.0** | **0.0** | **98.4** | **196.9** | **295.3** |

[44] Data obtained from Miyahuna shows that the total water loss was around 37%, of which one third was due to physical leakages in the supply network.

94. Reduction of embodied emissions in water used in demonstration buildings: It is expected that all water efficient fixtures and devices will be installed in 2018 so that direct emission reductions will accrue in 2019 onwards at approximately 1.9 $tCO_{2e}$ per year. This gives a cumulative direct emission reduction of ~7.6 $tCO_{2e}$ between 2019 and 2022. The breakdown of emission reductions for each building in given in **Annex SA5**. It is pointed out here that the investment in water efficient fixtures is not the main aim of the project. The global environmental benefit of reducing emissions will accrue mainly from applying building envelope thermal insulation as discussed next.

95. Reduction of emissions from the adoption of PV outdoor lighting: Direct emission reductions also accrue from the installation of standalone PV lighting. To calculate GHG emission reductions, it has been assumed that the lighting would be powered from the grid in the absence of GEF-financed interventions. For the incremental analysis, it is also assumed that in the absence of the UNDP-GEF project, the outdoor lights would be LEDs. This assumption is aligned with the discussions at paragraph 84 above. The detailed calculations are given in **Annex SA5**. Using data from **TABLE 8**, the total power of 570 units of lighting systems is equal to 11.04 kW, and consuming 47.7 MWh/yr. Using the grid emission factor given in paragraph 88 above, the total GHG emission reduction is 26.9 $tCO_2$/yr. According to the MYWP given in **Annex A**, all PV lighting systems will be commissioned by the end of Year 2 of the project. Hence, the total emission reduction accruing over the project lifetime is 80.7 $tCO_2$/yr. Assuming that the PV system has a lifetime of 20 years, the lifetime direct emission reduction is ~538 $tCO_2$.

96. **Total direct emission reductions from proof-of-concept interventions:** In 2022, the total direct emission reductions will reach ~573 $tCO_2e$ per year, and the cumulative direct emission reductions during the 5-year project lifetime are expected to be ~1,603 $tCO_{2e}$ (1,514 $tCO_{2e}$ from thermal insulation alone). Assuming a lifetime of 10 years for efficient water fixtures and devices, and 20 years for thermal insulation and PV lighting, respectively, cumulative direct emission reductions accruing from proof-of-concept interventions is expected to be ~11,441 $tCO_{2e}$ (10,883 $tCO_{2e}$ from thermal insulation alone). This shows that the main return on investment in terms of global environmental benefit of reducing emissions arises from building thermal insulation.

97. **Consequential emissions reductions accruing from updating and enforcing the Thermal Insulation Code:** There are plans to enforce the application of Thermal Insulation code in the residential sector as proposed in the NEEAP 2016 (please see Table SA2.4 in **Annex SA2**). However, the institutional structure for carrying out regular site visits during building constructions and also to peg the approval of building and occupancy permits to Building Energy Codes is still lacking. Although the Building Energy Codes already exist, they are poorly enforced. Besides updating the Building Energy Codes, the outputs of Component 2 will provide the human and institutional capacity building for enforcing the Building Energy Codes and especially the Thermal Insulation Code. The analysis has been carried out by the estimating the reduction in thermal energy needed for space heating by sectioning buildings into residential, commercial and public categories. It has been assumed that the penetration of building insulation according to the Thermal Insulation Code will be doubled in each building category by the end of the 5-year project lifetime. Using the parameters given in **Annex SA5**, consequential GHG emission savings of by enforcing the application of the Thermal Insulation Code, consequential emission reductions of 343,734 $tCO_{2e}$ are expected between 2018 and 2022, and 6,874,682 $tCO_{2e}$ between 2023 and 2042.

98. GEF abatement cost: Consequently, the total GHG emission savings accruing from the project are expected to be 7,229,858 $tCO_{2e}$. This gives a GEF abatement cost of 0.365 US$/$tCO_{2e}$, which is considered to be a conservative estimate of mitigation cost as it excludes the indirect emission reductions associated with awareness-raising, capacity development and replication.

## 3.3 Partnerships

### 3.3.1 Project partners

99. For the project to meet its objectives, a number of project partners have been identified as a part of the project approach to adopt a MSP (see Section 2). Since the project is operating at several geographical and political levels from the national institutions or government to the municipality to urban households in Greater Amman, the importance of the MSP approach cannot be underestimated. Through adoption of the MSP, the project will be implemented in a context where there are complementary baseline initiatives with which synergies must be forged to deliver maximum benefits productively (efficiently and effectively) to beneficiaries (as discussed in Section 4.1 below). **TABLE 11**Error! Reference source not found. provides a listing of these partners to achieve the intended results of the GEF-financed, UNDP-implemented project.

**TABLE 11. Contributions of project partners.**

| Stakeholder | Contributions | Relevant project outputs |
|---|---|---|
| Greater Amman Municipality (GAM) | The mission of GAM is to provide high quality municipal services of excellence focused on the environmental, health, organizational and infrastructure dimensions while maintaining the identity of the City of Amman, cultural heritage, community development, and concern of the human dimension through good planning, optimal investment of resources and building partnerships with stakeholders. Importantly, its role is to oversee the land use development in the City of Amman. To achieve this, its responsibilities consist of issuing construction and occupancy permits and land use licenses, and to oversee that urban development, including constructions are carried according to permits and licenses. In this respect, GAM has the responsibility to also enforce the Building Energy Codes within its jurisdictions. However, promoting low-carbon buildings forms part of a broader set of activities for increasing the resilience of the City of Amman against internal (urbanization and high population growth, water scarcity) and external (e.g. regional geopolitical context that drives an influx of refugees) shocks.<br>GAM is the national implementing institution for the UNDP-GEF project, and it will chair the PSC and host the PMU. Outcome 1 will be implemented directly under the oversight of GAM, and GAM will be the primary beneficiary for engaging with the GPSC that has been established under the GEF-financed Sustainable Cities IAP. In order to enhance the institutional and technical capacity of GAM to issue Occupancy Permits based on, among others, new building compliance with Building Energy Codes, a SDD will be set up in GAM. Appropriate technical capacity building will be provided to GAM engineers and inspectors for onsite monitoring of the implementation of Building Energy Codes, and in particular the Thermal Insulation Code.<br><br>Further, the Basman District Headquarter that is owned and managed by GAM is one of the buildings that have been retained from retrofitting under Output 4.2. | → Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.<br>→ Output 1.2: Quantification of all energy, water and material flows in the GAM.<br>→ Output 1.3: Institutional strengthening (Amman Urban Observatory) for data analysis and reporting.<br>→ Output 1.4: Assessment and costing of awareness-raising campaigns for the Sustainability Plan.<br><br>→ Output 2.1: A new SDD set-up within GAM.<br>→ Output 2.2: Enforcement capabilities of new SDD strengthened as regards compliance with Energy Building Codes.<br><br>→ Output 3.1: Development of an urban MRV system for (i) Building Energy Codes and (ii) energy efficient street lighting for determination of emission reductions from investments.<br>→ Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plan for existing and new buildings, and street lighting.<br><br>→ Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported.<br>→ Output 4.2: 3 existing public-sector buildings integrating best practice resource |

| Stakeholder | Contributions | Relevant project outputs |
|---|---|---|
| | | efficient/technology measures supported.<br>→ Output 4.3: Updated EE Lighting Code and smart usage system in place for all GAM lights.<br>→ Output 4.4: Stand-alone PV street lighting installed in GAM using the most energy efficient and site appropriate lighting technology available (e.g. LEDs) |
| Jordan National Building Council (JNBC) | According to the National Energy Efficiency Roadmap 2007, the JNBC is mandated to strengthen energy efficiency building codes and to establish clear responsibility to monitor adherence to the building codes by all planning and certifying agencies. The JNBC will accomplish its mandates in the project by: (1) updating existing Building Energy Codes, and (2) developing retrofit guidelines, especially regarding building envelope insulation, for existing buildings. It will also be closely involved in developing energy performance standards for a labeling scheme for buildings in accordance with the Building Energy Codes. | → Output 2.3: Update of the existing Building Codes and development of a 'Retrofit Building Guidelines' to make upgrades more acceptable.<br>→ Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates. |
| Ministry of Energy and Mineral Resources (MEMR) | The MEMR is responsible for implementing the National Energy Efficiency Action Plan (NEEAP) 2016. It is also the lead government institution that has oversight over the application of the RE & EE Law 2012 and the Bylaw on regulating Procedures and Means of Conserving Energy and Improving Its Efficiency 2012. It also has the overall responsibility to formulate national energy policy. MEMR has the responsibility to accredit energy auditors under the Bylaw of 2012. Further, according to the Jordan Energy Efficiency Roadmap, MEMR has the responsibility to establish a monitoring, evaluation and verification (MEV) mechanism to continually review and refine the government policies, together with the National Energy Research Center (NERC). The JREEEF is operated under the aegis of the MEMR. The MEMR has been involved during all the stages of project design, conceptualization, development, and it will play a key role in project implementation and monitoring & evaluation, especially since the UNDP-GEF project directly supports the implementation of the NEEAP 2016, and will provide technical assistance to JREEEF in order to operationalize a technical and commercial window for promoting EE in buildings, in collaboration with the SEED project. The MEMER will be closely involved in the application of UNDP's DEEI methodology for assessing the effectiveness of public de-risking instruments to promote Building Energy Codes using an ESCO model. MEMR will serve on the Project Steering Committee (PSC). | → Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to promote investments in Building Energy Codes.<br>→ Output 3.4: Identification and quantification of the effectiveness of different policy and financial de-risking instruments for EE buildings using UNDP's de-risking methodology (DEEI). |
| Ministry of planning and International Cooperation (MoPIC) | The Ministry of Planning and International Cooperation (MoPIC) is the official government body entrusted with responsibility for channelling funding from donor countries and organisations to Jordanian agencies and organisations. MoPIC also hosts the GEF-OFP, and it was consulted during the development stage of this project.<br><br>MoPIC will be the institution responsible for carrying out coordination between the proposed project and the initiatives of other development partners that are discussed in Section 3.3 | → Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plan for existing and new buildings, and street lighting.<br>→ Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to |

| Stakeholder | Contributions | Relevant project outputs |
|---|---|---|
| | and Supplementary Annex A (SA2). MoPIC is responsible for planning projects and programmes to be developed in Jordan, on a national scale, whether climate-focused or not. More specifically, then, MoPIC will be involved in coordinating the stakeholders during the development of the city-wide NAMA and its replication in other municipalities, as well as coordinating donors and development partners for financing the NAMA. Further, MoPIC can facilitate the implementation of the policy and financial de-risking instruments that will be developed under Component 3 by coordinating the technical and financial assistance provided by the donor community.<br><br>MoPIC is developing the Jordan Aid Information Management System (JAIMS) for mapping all ongoing projects and programs funded through foreign assistance (grants, soft loans, technical assistance, and twining programs) in various sectors. The UNDP-GEF project will work with MoPIC to include potential support for climate mitigation activities in JAIMS. This approach is also favored by the PMR project.<br>Finally, as the central public coordinating institution, MoPIC is also very well placed for communicating the lessons learned from the UNDP-GEF project to development partners, the donor community and regional partners. | promote investments in Building Energy Codes.<br><br>→ Output 3.4: Identification and quantification of the effectiveness of different policy and financial de-risking instruments for EE buildings using UNDP's de-risking methodology (DEEI).<br><br>→ Output 3.5: Lessons learnt, experiences and best practices related to the project are compiled and disseminated in other cities of Jordan and MENA countries. |
| Jordan Standards and Metrology Organization (JSMO) | JSMO plays a proactive role in enhancing the competitiveness of Jordanian products in the national, regional and international markets. To achieve this, JSMO fulfils its mandate to build, implement and update systems compatible with international practices in the fields of standardization, metrology, conformity assessment, market surveillance, accreditation, information and related areas. In this project, JSMO is responsible for supporting the adoption of appropriate building standards for developing a building energy performance certification and labeling scheme. JSMO also plays a key role in establishing the specifications for laboratory testing equipment and their commissioning.<br>JSMO is, therefore, a key stakeholder for establishing standards and carrying out conformity tests for materials and equipment that are promoted in Building Energy Codes. | → Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates. |
| Private sector<br><br>(new building developers; the Jordan Housing Developers Association; and ESCOs) | The private sector is an important investor in the building and construction sector in Jordan. In the proposed project, the private sector will be directly involved in the investment component – i.e. Component 4 – through the implementation of Energy Building Codes in two new buildings. The two private sector projects are described in Section 3.1.4, and are supported by letters of co-financing (Annex J).<br><br>The private sector building developers will be engaged directly with the project as explained in Section 3.3.2 during the implementation of the Thermal Insulation Code, and the monitoring & evaluation of the building energy performance after their commissioning. Since the developers are also members of the Jordan Housing Developers Association (JHDA), the UNDP-GEF project will avail of this opportunity to promote low-carbon buildings and the results of the project to all the members of the JHDA. It is pointed out that the two private building developers were identified during the project design and development phase through interactions with the JHDA. | → Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes.<br><br>→ Output 2.5: At least 5 ESCOs accredited and capacitated via programme.<br><br>→ Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported. |

| Stakeholder | Contributions | Relevant project outputs |
|---|---|---|
| | Other private sector parties that will benefit from the UNDP-GEF project are ESCOs that will be trained and accredited under Outcome 2. As discussed in Section 3.1.2, the ESPs that have been capacitated by the USAID-financed ESCB project will be capacitated as ESCOs. | |
| National Energy Research Centre (NERC) | NERC is part of the Royal Scientific Society (RSS) which is the largest applied research institution, consultancy, and technical support service provider in Jordan and is a regional leader in the fields of science & technology. The main goal of NERC is to ensure EE conditions in the relevant sectors (industry, buildings) and support the relevant market key actors as also energy consumers in reducing overall energy consumption.<br><br>NERC offers services as an ESP, and based on its experience, it will support the development of a training and accreditation programme for ESCOs. Leveraging its prior experience on establishing a national database for EE appliances in buildings, NERC will expand the scope of the database to also include EE measures proposed in this UNDP-GEF project.<br><br>NERC also has experience in developing Sustainability Strategies and Plans for municipalities (e.g. Municipalities of Sahab, Aqaba and Karak), and supporting their accession to the Covenant of Mayors. This experience will be valuable towards the implementation of Outcome 1.<br><br>NERC also has experience with retrofitting the Higher Council for Science and Technology building with proper envelope insulation, glazing and geothermal heat pump. It is currently constructing a new building to house NERC offices and laboratories that will adopt the Green Building Code. These experiences will be invaluable for designing retrofit guidelines for existing buildings and to bring the energy performance of new buildings up to the level of Building Energy Codes. | → Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.<br><br>→ Output 2.3: Update of the existing Building Codes and development of a 'Retrofit Building Guidelines' to make upgrades more acceptable.<br><br>→ Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes.<br><br>→ Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported.<br><br>→ Output 4.2: 4 existing public-sector buildings integrating best practice resource efficient/technology measures supported. |
| Ministry of Environment (MoE) | The Ministry of Environment is the focal point for climate change issues. MoE is responsible for the implementation of the National Climate Change Policy. The Climate Change Directorate (CCD) was created under the aegis of MoE in August 2014. It is the National Focal Point for the UNFCCC and the Designated National Authority (DNA) for the purpose of facilitating Jordan's participation in Clean Development Mechanism (CDM). The MoE also hosts the Green Economy Unit (GEU) that is developing a "National Strategy and Action Plan for Transitioning to a Green Economy in Jordan: 2016-2025". The GEU was established by a decree from the Prime Minister's Office, and it is supported by UNEP and GGGI (Global Green Growth Institute). It will be responsible for implementing the National Strategy and Action Plan for Transitioning to a Green Economy.<br><br>The MoE was involved during PIF development, and has been consulted during the PPG phase concerning the design of Component 3, and more precisely the outputs related to the development of standardized baselines as part of a MRV system for tracking GHG emission reduction in buildings, and the design of an urban NAMA. The CCD will ensure that these activities are aligned with and complementary to those that will be carried | → Output 3.1: Development of an urban MRV system for (i) Building Energy Codes and (ii) energy efficient street lighting for determination of emission reductions from investments.<br><br>→ Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plan for existing and new buildings, and street lighting |

| Stakeholder | Contributions | Relevant project outputs |
|---|---|---|
| | out under the PMR project, as well as building on what has been achieved under the First BUR. Since the Minister of Environment is the chairperson of the National Climate Change Committee (NCCC), the MoE will also provide the coordination link between the UNDP-GEF project and the NCCC. | |
| Jordan Green Building Council (JGBC) | The JGBC is a member-based not-for-profit organization with mission to promote and advocate for the adoption of Green Building Practices in all phases of the building process leading towards making Green Buildings a widespread reality in Jordan. The Council is part of a global network of more than 80 GBCs worldwide and holds the authority to represent the World Green Building Council (WGBC) in Jordan. As discussed in Section 3.1.2, the JGBC has been active in developing a tool for promoting the benefits of applying Building Energy Codes, as well as developing a Mini-Checklist, which is a simplified rating tool customized for both existing and new buildings in Jordan. The Mini-Checklist can serve as a precursor for developing a full-fledged energy performance labeling scheme for Jordan that is compliant with the Jordanian Building Codes and the Jordanian Green Building Guide. Similarly, the UNDP-GEF project will enhance the functionality of JGBC's Excel-tool under Output 2.6. | → Output 2.6: Development and dissemination of an online tool for carrying out comparative socio-economic and environmental analysis of buildings using life-cycle methodology.<br>→ Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates. |
| GIZ | GIZ was consulted during project design and development, specifically in regard to its projects aiming to reduce the energy intensity of water supplied in cities and towns in Jordan. Although GIZ does not have any specific projects in the proposed fields of activities, it has provided a letter of support for the UNDP-GEF project. The projects of the GIZ aim to reduce the energy intensity of water by adopting EE measures on the water supply side, and to make more use of RE sources for water pumping and distribution. These activities are complementary to the end-use water efficiency that is proposed in the UNDP-GEF project.<br><br>Further, the GIZ has supported the development of NAMA in the building sector in Tunisia, and the lessons learned will be used to inform the design of the urban NAMA proposed under Outcome 3. | → Output 3.1: Development of an urban MRV system for (i) Building Energy Codes and (ii) energy efficient street lighting for determination of emission reductions from investments.<br><br>→ Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plan for existing and new buildings, and street lighting. |
| EU-Delegation (& REEE II Programme) | The EU-Delegation was consulted during the PIF development and the PPG stage. During the PIF stage, UNDP was made aware that EU funding that would be forthcoming in 2014 (for the period 2014-2018) will be directed towards the implementation of the National Energy Efficiency Action Plan (NEEAP). The EU-funded Renewable Energy and Energy Efficiency (REEE) II programme is now in the implementation phase. Discussions have held with the REEE II management team for coordination with the UNDP-GEF project.<br><br>Collaboration with the REEE II programme will take place around the following: (1) developing and enforcing stricter energy performance standards in buildings; and (2) promote available EU subsidies through JREEEF for investment in RE and EE measures. The latter is an option for supporting the implementation of financial de-risking instruments that will be identified, quantified and assessed for their effectiveness in the UNDP-GEF project. | → Output 2.2: Enforcement capabilities of new SDD strengthened as regards compliance with Energy Building Codes.<br><br>→ Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates.<br><br>→ Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to promote investments in Building Energy Codes.<br><br>→ Output 3.4: Identification and quantification of the effectiveness of |

| Stakeholder | Contributions | Relevant project outputs |
|---|---|---|
| | | different policy and financial de-risking instruments for EE buildings using UNDP's de-risking methodology (DEEI). |
| Co water (& SEED Project) | The SEED project is implemented by Cowater International using bilateral Canadian financing. It aims to promote sustainable economic growth in Jordan by driving entrepreneurship and livelihoods through RE and EE. SEED's principal partner is the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF). In collaboration with the SEED project, the UNDP-GEF project will assist JREEEF to develop its post-2020 action plan with customized financial instruments, including delivery model, for promoting Building Energy Codes. There will also be knowledge sharing on the development of a prototype EE residential building in either the Jordan Valley or the Ajloun region that the SEED project will develop as a best practice demonstration. | → Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to promote investments in Building Energy Codes.<br><br>→ Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported. |
| USAID | USAID has supported the utilities in Jordan to support end-use energy efficiency measures. One component of the ESCB project seeks to train and accredit Energy Service Providers (ESPs). The GEF-financed, UNDP-implemented project will build on the achievements of the USAID technical assistance to support the establishment of ESCOs. | → Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes. |
| UNDP CO | The UNDP Country Office (CO) has been supporting the Hashemite Kingdom of Jordan with strengthening institutional capacity for carrying out evidence-based policy planning to enhance the resilience of Jordan against shocks, such as the refugee crisis.<br><br>UNDP will monitor the implementation of the project, review progress in the realization of the project outputs, and ensure the proper use of UNDP/GEF funds. Working in close cooperation with GAM, the UNDP CO will provide support services to the project - including procurement, contracting of service providers, human resources management and financial services - in accordance with the relevant UNDP Rules and Regulations, Policies and Procedures and Results-Based Management (RBM) guidelines. The agreement for the delivery of these services is found in **Annex SA8**.<br><br>UNDP CO also provides its services through technical advice, facilitating change processes, support to mechanisms for advocacy, networking and partnership building including intermediation for information, expertise and funds, and knowledge development and dissemination.<br><br>It will also contribute directly to the implementation of Outcomes 1 and 2 through the provision of parallel financing. In particular, the UNDP will finance the participation of GAM and other local stakeholders in the capacity building activities and annual milestone event organized by the GPSC. | → Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.<br><br>→ Output 1.2: Quantification of all energy, water and material flows in the GAM.<br><br>→ Output 1.3: Institutional strengthening (Amman Urban Observatory) for data analysis and reporting.<br><br>→ Output 2.1: A new SDD set-up within GAM.<br><br>→ Output 2.2: Enforcement capabilities of new SDD strengthened as regards compliance with Energy Building Codes. |

100. The project will also collaborate with a number of other ongoing government and donor agency projects in sustainable urban development. These are listed in the following paragraphs with more details provided in **Annex SA2**.

101. The ***USAID Energy Sector Capacity Building (ESCB) Activity*** (2013-2017) works with Jordanian energy sector partners to cultivate effective policies and decision-making in the energy sector; and to build sustainable institutional and organizational capacity to increase the adoption of renewable energy and energy efficiency technologies and practices. ESCB places a high priority on addressing gender issues in the energy sector, including promotion of women in energy-related careers. It applies a broad, adaptable approach to meet the energy sector's evolving needs, including:

- Successful development and adoption of a utilities incentive mechanism to promote energy efficiency, including a robust monitoring, evaluation, and validation system;
- Increased institutional capacity of the Jordanian energy sector partners including the Ministry of Energy and Mineral Resources, Electricity Regulatory Commission, and electricity production, distribution, and transmission companies;
- Strengthened presence, capacity and regulation of energy services companies through market research, business development services, accreditation of those companies, and the creation of a coalition of energy services association; and
- Flexible response mechanism for emergent energy sector needs and opportunities on a demand-driven basis.

102. The ***Sustainable Energy & Economic Development (SEED) Project (2016 – 2020, ~US$ 18.5 million)*** aims to drive sustainable economic growth in Jordan via three project pillars: (i) improved living conditions and livelihoods for women and men in the Jordan Valley and Ajloun region by introducing RE and EE solutions at a household level; (ii) increased skills and employment prospects for workers in Jordan's RE&EE sector; and (iii) a stronger enabling environment for the growth of a robust RE sector in Jordan. SEED's principal partner is the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF), and it collaborates with key Jordanian organisations including the Jordan River Foundation (JRF). JREEEF is a beneficiary of technical assistance under pillar (iii). The project will be implemented primarily in the Jordan Valley, Ajloun and other areas outside Amman, with a small satellite office co-located in JREEEF's premises in Amman. Community Based Organisations (CBOs) will be leveraged for implementation and the project staff will work closely with JRF to supervise and organize these activities.

103. The European Union-financed ***Renewable Energy and Energy Efficiency (REEE II) Programme (2016 – 2019, ~US$ 3.6 million)*** In Jordan aims to support the government's efforts to increase the share of RE to 10% and to realise 20% of energy savings by 2020. REEE II is part of a EUR 90 million (~US$ 95.4 million) programme to support Jordan's energy strategy. Other initiatives covered by the programme include a EUR 47.5 million (~US$ 50.4 million) contribution to the government budget to cover expenses such as developing an appropriate legal and regulatory framework, preparing strategic plans, organising a structured policy dialogue, and supporting investments in RE such as solar water heaters, photovoltaic rooftop systems, solar water pumps, efficient street lighting, and EE applications in the building sector. The EU is also supporting investments made through the EBRD. These will reduce the cost of water pumping by equipping the main stations with solar power, and implementing a waste-to-energy facility in the Greater Amman Municipality.

104. The Ministry of Environment is currently coordinating two projects that are related to the design and implementation of MRV systems. The preparation of the World Bank-financed ***Partnership for Market Readiness (PMR)*** project was initiated in May 2012, and implementation started in May 2016 (***2016 – 2019, US$ 2.96 million***).[45] The PMR project seeks to develop a path for market-based climate change mitigation instrument in Jordan. It focuses on the development of a robust MRV framework and technical assistance activities to enhance the capacity and readiness of public and private sector actors for climate financing and market instruments. Considering the continuing uncertainty regarding sources of international demand for credits, Jordan will explore innovative, locally-appropriate market mechanism

[45] Please see https://www.thepmr.org/country/jordan-0 - accessed 20 February 2017.

that could create domestic demand in the future. The PMR is proposing a phased approach, with the first implementation phase focusing on: (i) developing a robust and transparent MRV framework that builds on and utilises the existing information management systems managed by different ministries and funds; and (2) engaging the private sector through technical assistance and capacity building and increase market participation through web-based registry for climate projects and financing sources.

105. The ***Sustainable Cities Integrated Approach Pilot (IAP) (2016 – 2021, ~US$ 137.8 million)*** is a GEF-financed, World Bank-implemented project that seeks to promote among participating cities an approach to urban sustainability that is guided by evidence-based, multi-dimensional, and broadly inclusive planning processes that balance economic, social, and environmental resource considerations. It is being implemented in 11 countries (Brazil, China, Cote d'Ivoire, India, Malaysia, Mexico, Paraguay, Peru, Senegal, South Africa and Vietnam, and it has four components: (1) enhancing integrated sustainable urban planning and management; (2) monitoring local and globally relevant performance frameworks for improved performance; (3) catalysing investments in sustainable cities; and (4) enhancing partnerships for sustainable cities at local, national, and global levels through knowledge management, capacity building, global coordination.

106. One of the knowledge products that have been developed by the GPSC is the Urban Sustainability Framework (USF). The key components of the USF are discussed Section 3.1.1 in the Project Document. The USF makes use of an extended list of indicators for benchmarking, and monitoring and evaluating the sustainability of a city. These indicators are aligned with the key targets of SDG 11 – i.e. 'make cities and human settlements inclusive, safe, resilient and sustainable' (Table SA 2.7 in **Annex SA2**). The GPSC USF will also include reference indicators spanning across several different dimensions including: economy, land use/urban form, connectivity and transport, environment and resource efficiency, climate change, population social health and education, welfare and health, fiscal sustainability and governance (Table SA2.8 in **Annex SA2**).

### 3.3.2 Stakeholder engagement

107. The primary stakeholder beneficiaries to be engaged in the UNDP-GEF project will be the urban inhabitants in GAM. This will include several classes of stakeholders, from central Government policymakers to municipal personnel, private businesses engaged in building thermal insulation to the ultimate beneficiaries who are the users and occupants of the buildings that will serve as proof-of-concept for enhancing building thermal insulation. The primary lever to engage stakeholders within the project is the decentralisation of governance responsibilities to the municipal level. As discussed in Section 3.1.1, the USF that has been developed by the GPSC under the GEF-financed Sustainable Cities IAP will be adopted for developing a Sustainability Plan, Financing Strategy and city-level outreach plan for GAM. The multi-stakeholder engagement approach proposed by the USF will be adopted. This will involve engaging local communities to understand the needs and benefits of pursuing a sustainable development agenda at the municipal level, and to be fully engaged in the implementation of the Sustainability Plan, which will cover climate change mitigation, including low-carbon buildings and enhanced water efficiency in buildings.

108. More specifically, central Government policymakers will be engaged with the project to strengthen the efforts of the Go to fulfill the objectives of the National Energy Efficiency Action Plan (NEEAP) 2016, and the National Green Growth Plan (NGGP) 2016 to promote significantly greater diffusion of thermal insulation and other Building Energy Codes. For instance, NEEAP 2016 specifically intends to promote building thermal insulation in 66,000 new buildings to 2020, and the NGGP has recommended the conduction of a de-risking study for promoting EE in buildings. As explained in Section 3.1.3, the UNDP-GEF project will apply UNDP's DEEI methodology for assessing the effectiveness of selected public de-risking instruments in promoting Building Energy Codes using an ESCO model. National institutions will also be engaged in the project during the design of standardized baselines and MRV systems, and for coordinating development partners. The roles of the national public institutions participating in the project are listed in **TABLE 11**.

109. For municipal personnel (GAM), their engagement with the project will stem from the benefits they will derive from the project's capacity building efforts, which will enable municipal personnel to improve their abilities to service their clients in delivering Occupancy Permits following the inspection of buildings according to the specifications of the Building Energy Codes, and in particular the Thermal Insulation Code. Stakeholder engagement at the municipal level will take place predominantly through the SDD that will be established in GAM by the project (see Section 3.1.1).

110. The private sector and private individuals will also be engaged with the project mainly through Outcomes 3 and 4. Under Outcome 3, small and medium enterprises will be trained and accredited as ESCOs for delivering EE solutions in buildings through EPC modality. Further, the private sector and private individuals will be directly engaged in the project through the implementation of building envelope thermal insulation in their respective buildings as discussed in Section 3.1.4.

111. Lastly, in recognition that the UNDP-GEF project is not operating in a vacuum and that it does not have all the financial means to carry out all possible activities to promote low-carbon buildings in GAM, development partners will be engaged with the project either directly through collaborative efforts with their ongoing projects as discussed in Section 3.1 or through donor coordination that will be carried out by MOPIC in order to seek the political and financial support for the implementation of selected outputs of the UNDP-GEF project such as the urban NAMA and the public de-risking instruments.

### 3.3.3 Mainstreaming gender

112. A gender-differentiated approach was used to inform the design of the UNDP-GEF project design. The details of the Gender Analysis study are given in Supplementary Annex 6 (**Annex SA6**). The main conclusions that can be drawn from the gender analysis study are:

- The survey and gender analysis results indicate there are key differences between men and women when it comes to: (i) perceptions on energy efficiency (EE) measures, (ii) access to knowledge and financing options, and (iii) the roles they play in applying EE measures in their households;
- The survey results revealed that the majority of the Jordanian public held positive perceptions towards EE measures. While household EE measures were reported to be expensive, the general perception was that they were effective and worth the investment. The survey results show that women held more positive perceptions of EE measures than men. For instance, nearly 20% more women believed in the effectiveness of EE measures when compared to men, while 10% less women believed that EE measures were expensive when compared to the perceptions of their male counterparts. That being said, nearly 50% of both men and women believed that EE measures were worth the investment. This belief is perhaps reflected in individuals' willingness to install EE measures. The majority of respondents felt encouraged to purchase houses and appliances that feature EE measures. The main incentive behind installing and implementing household EE measures was the financial return, while environmental and regulatory concerns took a secondary role. As such, awareness campaigns that emphasized the financial return on investing in efficiency measure are recommended;
- In terms of regulatory concerns, nearly one third of individuals are aware of any retrofitting guidelines in Jordan, and only 5% believe that these guidelines are adequately applied in Jordanian buildings. Awareness is nearly 10% lower among women as they have less access to market based knowledge in the energy efficiency sectors. As such, it is proposed that these guidelines are updated and made more accessible to the public, and that a new energy efficiency unit is established at GAM that enables women engineers in the EE field;
- Women are perceived to have less market-based access to developments in the EE sector and to financing options. This is likely do to with the higher employment rates among men, as employment gives them more market access and access to financial institutions. Nonetheless, women are gaining more access through digital media outlets. Therefore, it is proposed that workshops be held at women's organizations that give women more access to market-based knowledge, and inform

women of financing options and incentive schemes for installing EE measures in their households. Similarly, more simplified workshops are proposed to be held at schools around the Kingdom, in order to inform the next generation of women of the benefits of installing EE measures – whether financial or environmental; and

- Another key difference between men and women when it comes to installing EE measures is in their perceived roles. Men played a leading role when it comes to decisions involving construction work, infrastructure, and maintenance. On the other hand, women were perceived to have a more equal (if not leading) role when it came to: selecting features of a house at the point of purchase, household design and renovation works, and selecting household appliances. It is recommended that the aforementioned workshops address EE features to look for when assessing a house or home appliance for purchase.

113. Based on the above findings, the Gender Action Plan shown in **TABLE 12** has been integrated in the project design.

**TABLE 12. Gender Action Plan.**

| ***Project-level outcome: The enabling conditions, methodologies and tools in the GAM for enforcing and enhancing regulatory frameworks (including financial incentives) for EE buildings and street lighting are strengthened*** | | | | | | |
|---|---|---|---|---|---|---|
| **Gender-related activity** | **Indicator** | **Target** | **Baseline** | **Budget** | **Timeline** | **Responsibility** |
| *- New SDD at GAM with female engineer(s) participation.* | *The EE Unit technical staff include women participation from GAM* | *1/3 of technical staff are women* | *No existing EE unit at present* | *% of budget or total estimated amount (no effect on EE unit budget)* | *Year 1* | *GAM* |
| *- Update of the existing Building Energy Codes and development of a "Retrofit Building Energy Code" to make upgrades more acceptable* | *The new Retrofit Building Energy Code accounts for the participation of women and men in the implementation* | *1 workshop is developed to integrate the priorities and needs of women in the code.* | *Existing building energy code* | *Workshop cost, moderator, and gender specialist (up to 10'000 USD)* | *Year 2* | *Project Gender Specialist in coordination with GAM and NBC* |
| *General awareness raising targeting women* | *Women become aware of EE measures and incentives / financing options* | *12 small workshops in various areas of Amman targeting at least 200 women and 200 female school students* | | *Workshop and material preparation and gender specialist (10'000 USD)* | *Year 1* | *Gender specialist + consultant + GAM EE unit* |
| *Project-level outcome: Performance-based GHG monitoring frameworks for low-carbon building and streetlights* | | | | | | |
| **Gender-related activity** | **Indicator** | **Target** | **Baseline** | **Budget** | **Timeline** | **Responsibility** |

| | | | | | | |
|---|---|---|---|---|---|---|
| *Lessons learnt, experiences and best practices related to the project are compiled and disseminated in other cities in Jordan and MENA countries.* | *3 workshops to disseminate the lessons learnt are held with women organizations in 3 major cities (north, middle, south) of Jordan* | *3 workshops with women organizations outside Amman.* | *No such focused activity exist* | *15'000 USD* | *Year 3* | *GAM and a consultant* |
| | *Women's online forum (eg. Facebook page) to share success stories/ ask for tips and advice* | *Facebook page for women engaging in EE* | *No such activity exists* | *5'000 USD* | *Year 3* | *GAM / JGBC / consultant* |
| *Project-level outcome: Targeted proof-of-concept mitigation interventions* | | | | | | |
| **Gender-related activity** | **Indicator** | **Target** | **Baseline** | **Budget** | **Timeline** | **Responsibility** |
| *2-6 new private-sector residential buildings integrating best practice resource efficiency measures are supported* | *Women in private residential buildings are informed of the EE measures, investment and financial returns and financing options via a dedicated media campaign (TV and Radio)* | *At least 50 housewives are informed and made aware of the EE measures that can be applied in buildings* | *No gender focused information tool exists to date* | *Cost of Information material preparation, small workshops. 10'000 USD Media campaign and gender consultant. 20'000 USD* | *Year 2-3* | *GAM with Gender specialist* |
| ***Total budget allocation (% or amount):*** | | | | | *70'000 USD* | |

### 3.3.4 South-South and Triangular Cooperation (SSTrC)

114. As discussed above (Section 3.1.3), the GEF-financed and UNDP-implemented project will compile and disseminate lessons learned and experiences and best practices with other MENA countries (Output 3.5). The Jordan is well placed to do this since its Building Energy Codes have already been adopted by several MENA countries, including the United Arab Emirates.

115. The trend for high energy demand for buildings in the Arab region is expected to continue over the next decade due to high population growth and significant urbanization. Based on the reported literature, the potential energy savings opportunities and their cost-effectiveness for buildings are high and estimated around 20-25% and may reach 40%, or more, in case of some Gulf countries. Using a comprehensive series of analyses, this project will summaries the economic and environmental benefits of improving EE for both new and retrofitted buildings in Jordan. The relevance to the Gulf States relates to their still relatively high energy subsidies.[46]

[46] Please see introduction on the state of energy subsidies in the GCC in: T. Boersma and S. Griffiths (2016). Reforming Energy Subsidies – Initial lessons from the United Arab Emirates. (https://www.brookings.edu/wp-content/uploads/2016/07/brookings_masdar_reforming_energy_subsidies_uae.pdf - accessed 6 March 2017); Please also see RCREEE (2015). Arab Future™ Energy Index (AFEX) Energy Efficiency 2015 (http://www.rcreee.org/content/arab-future-energy-index%E2%84%A2-afex-2015-energy-efficiency – accessed 6 march 2017).

116. The sharing of lessons learned in MENA countries will be carried out in collaboration with the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE). Further, SSTrC will be enhanced through the participation on GAM in the coordination, lessons sharing and capacity building activities that will be carried out by the Global Platform on Sustainable Cities (GPSC).

# 4. FEASIBILITY

## 4.1 Cost efficiency and effectiveness

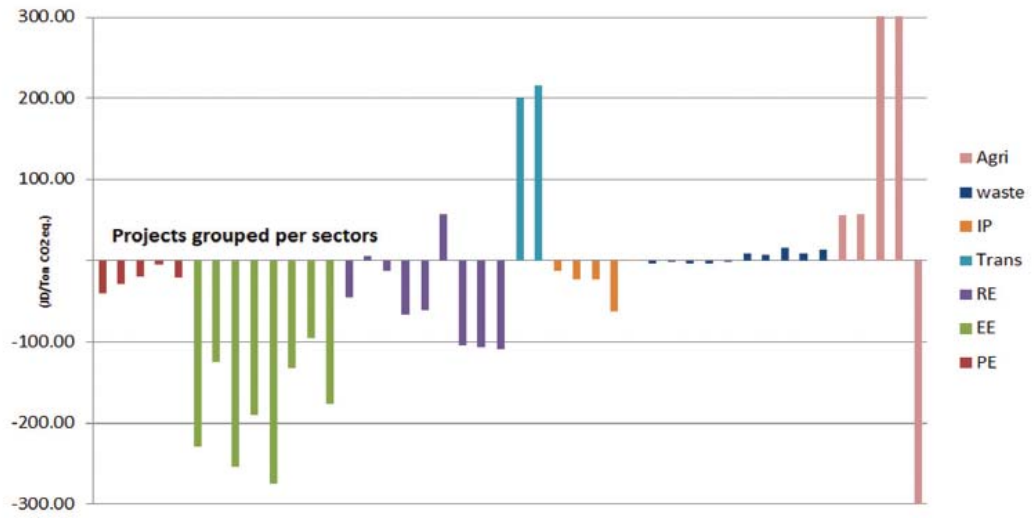
117. The project is designed to remove all identified obstacles and barriers towards achieving GHG emission reductions and strong sustainable urban development and adaptation co-benefits through the adoption of thermal insulation in buidlings and more efficient use of water in buildings. The project builds on the foundation laid by previous programmes (e.g. technical assistance provided by USAID) and complements ongoing programmes as discussed in Section 3.1. By drawing from lessons learned from past initiatives and by collaborating with ongoing initiatives, the GEF-financed, UNDP-implemented project will ensure cost efficiency.

118. Marginal GHG abatement cost curves are used to indicate the economic attractiveness of GHG mitigation options, along with the amount of GHG reductions achievable via those options. Economic attractiveness is measured in terms of unit cost of GHG reductions – i.e. by dividing the total cost associated with GHG abatement by the amount of GHG emissions reduced during the economic life of the GHG mitigation option or technology. Based on a unit abatement cost and an abatement marginal cost curve developed as part of the Third National Communication, the most feasible mitigation options (considered in aggregate as a category) in Jordan are considered to be in the energy sector. Energy efficiency and renewable energy interventions in Jordan have unit cost range savings from -13 to -275 JD/$tCO_2$ (US$18.2 – 385/$tCO_2$).[47]

119. **FIGURE 7** shows the marginal abatement cost curve (MACC) for various clusters of mitigation measures.[48] The negative abatement costs clearly show that, from a cost-effectiveness perspective, EE interventions – i.e. those shown in green in **FIGURE 7**, including options for EE building retrofits and EE street lighting - are, as a category, the lowest-cost options available for reducing GHG emissions. Of the 45 mitigation measures analysed, the TNC found that the marginal abate cost for insulating the walls and roofs of 35,000 new houses was the second lowest at -274.8 JD/$tCO_2$ (i.e. 385 US$/$tCO_2$).

[47] 1 JD = 1.4 US$.

[48] The Hashemite Kingdom of Jordan. 2014. Jordan's Third National Communication on Climate Change, pg. 106.




Source: Jordan's Third National Communication (TNC) on Climate Change, 2014

**FIGURE 7. Marginal abatement cost curve for all mitigation measures grouped according to sectors in Jordan.**

## 4.2 Risk Management

120. The risks associated with the proejct are detailed in **TABLE 13**, and include risks emanating from the SESP shown in **Annex F**. As per standard UNDP requirements, these risks will be monitored quarterly by the Project Manager. The Project Manager will report on the status of the risks to the UNDP Country Office, which will record progress in the UNDP ATLAS risk log. Risks will be reported as critical when the impact and probablity are high (i.e. 5). Management responses to critical risks will also be reported to the GEF in the annual PIR.

**TABLE 13. Project risks and mitigation measures.**

| Description | Type | Impact & Probability | Mitigation Measures | Owner | Status |
|---|---|---|---|---|---|
| Further deterioration in the security climate or increase in terrorism accompanying economic impacts | Political | Probability – Lack of political support from GAM because of the pressing needs to provide services to refugees.<br><br>Impact – Delay in project implementation due to the need to manage an ongoing refugee crisis at the expense of the project.<br><br>P = 3<br>I = 3<br>Risk - Moderate | Despite the difficulties experienced in some sectors, the Jordanian economy has generally weathered the difficult regional security climate and has continued to expand, albeit not at the robust pace seen in the previous decade. The Latest EIU country report (July 2015) states that: "*Helped by rising construction activity and a rebound in agriculture after a difficult, real GDP grew by 3.1% in 2014. The overall pace of growth, although picking up gradually, will remain constrained in the near term by the impact of regional instability—Syria and Iraq traditionally being Jordan's main export markets and tourism also a key sector—and the effect of lower oil prices on regional liquidity. Meanwhile, high unemployment will act as a continuing drag on private consumption, although work on large infrastructure projects and tourism expansion projects should help to boost employment, and lower oil prices will increase consumer purchasing power. Economic growth in 2015/16 will be higher than in 2013/14, at an annual average of 3.9%.*" Additionally it is important to note that the US has also said that it will increase annual aid to Jordan from US$660m to US$1bn a year in 2015/17 and has extended loan guarantees.<br><br>Further, since the beginning of the crisis the European Commission has allocated more than €657 million in assistance to refugees and vulnerable communities in Jordan. The EU will continue to support humanitarian actors on the ground in the assistance to vulnerable Syrian refugees in particular the new arrivals in camps and those living outside of camps, as well as Jordanian host communities.[49]<br><br>With no sign that the regional political situation is likely to improve in the near-future, Jordan will continue to face considerable economic pressure. However, Jordan closed its | Project Steering Committee, Project Manager, UNDP Country Director | No change |

[49] European Commission. (2017). ECHO Factsheet – Jordan: Syria Crisis – January 2017.

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| | | | northern border with Syria in December 2016 as a means to curb the influx of refugees and to stabilise the socioeconomic pressures it is facing.[50]<br><br>In contrast to other neighbouring countries, Jordan has, so far, not been severely impacted by terrorism.<br><br>There is little the project can do to mitigate or prepare for deterioration of the security situation or the risk of increased spillover effects of the Syrian conflict into Jordan and the GAM. However given that the project rationale and design are specifically designed to achieve cost savings for both the GAM and end users and generate strong economic co-benefits, its relevance will remain. | | |
| Capacity of duty bearers to meet their obligations in the project | Institutional capacity | P = 2<br><br>I = 3<br><br>Risk - Moderate | As the project was initiated by GAM it is expected that they will be willing to build the capacity for project implementation. GAM has signed a MOU with the UNDP to provide substance to its commitment to provide all the human and institutional support to the project through the creation of the Sustainable Development Department. Further, human and institutional capacity strengthening will of GAM will be carried out under Components 1, 2 and 4 of the UNDP-GEF project. Further the HACT micro-assessemnt shown in Annex I demonstrates that the GAM has the fiduciary and due diligence processes in place to implement the proposed project. | GAM, Project Manager | No change |
| Impact of low oil prices | Economic | P = 1<br><br>I = 3<br><br>Risk - Low | According to most studies the recent fall in oil prices has had a positive impact on the Jordanian economy in the short run, lowering production costs and price pressures on citizens and refugees, reducing fiscal pressures related to oil imports for energy, negating the need for past oil subsidy payments from the government to households, and ultimately reducing the twin deficits. In the medium term, however, and depending on the length of the oil price slump, the net effect could turn negative, primarily from lower grants from the GCC on which Jordan is dependent to fund its fiscal deficits, and lower remittances from its diaspora in oil-producing countries. This could impact the budgets of the GAM and many companies in terms of their ability or appetite to invest in EE measures. | Project Steering Committee | No change |

[50] European Commission (2017).

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| | | | However generally low oil prices have a largely positive fiscal effect as it pertains to cash transfers from the GAM aimed at compensating households for the removal of fuel subsidies for which about $300 million had been budgeted (nationally) for each of 2014 and 2015 in the 2014 budget. As originally designed, when oil prices fall below $100, the cash transfer automatically stops. As a result, the December 2014 disbursement did not take place. The influx of Syrian refugees has affected the cost of living in terms of higher rental costs, but generally inflation has been moderate, helped mainly by lower global oil prices. In the first quarter of 2015 the consumer price index actually contracted by 0.9%, compared with a rise of 3.3% in the same quarter of 2014, with the cost of transport and fuels and lighting declining by 16.3% and 11.6% respectively.<br><br>Given that according to AFEX 2015 Jordan has the third highest energy prices in the region, even with lower oil prices there is a strong incentive for consumers and GAM authorities to invest in the EE measures included in this project, which as noted are among the most cost-effective in the country. | | |
| Climate Change | Climate | P = 2<br><br>I = 4<br><br>Risk - Moderate | The ambient temperature in Jordan is expected to increase in the future due to climate change. As discussed, energy building codes related specifically to building envelope insulation will be an effective form of adaptation to this climate impact. The Third National Communication to the UNFCCC includes a special chapter on municipal needs for urban adaptation to climate change in Jordan, and the project has been specifically informed by the recommendations contained therein. Adaptation measures which will be incorporated into this project include; 1) introduction of climate-responsive building techniques and elements to reduce the effect of heat and reduce demand on energy for cooling; 2) Promotion of the use of energy-saving devices, and raising awareness on the long-term benefits of energy efficient devices; 3) amendments to sector policies and regulations, such as building codes, to reflect climate change risks and to direct people towards insulating buildings to reduce energy demand; and 4) zoning and development changes to reflect increased vulnerability of specific locations and/or resources. | Project Steering Committee, Project Manager | No change |

| | | | | | |
|---|---|---|---|---|---|
| Social acceptability of EE buildings | Social | P = 1<br>I = 3<br>Risk - Low | The social acceptability of the proposed project is expected to be high in Jordan, especially in a context of increasing prices of electricity and water and temperature increases. The proposed project is also expected to create skilled green jobs that are a social and political priority in Jordan. The capacity building and communication activities proposed in the project will enhance the awareness of stakeholders about the socio-economic and environmental benefits of resource efficiency measures and mitigate this risk, as will the proof-of-concept investments supported under Component 4.<br><br>Further, any health risks associated with the use of hazardous or dangerous metarials and products in building envelope insulation will be avoided by developing and enforcing national standards for insulation materials and products as discussed in the SESP in Annex F. | | No change |
| High financing costs or lack of financing could undermine the viability of the propsoed investment measures and approaches | Financial | P = 2<br>I = 3<br>Risk - moderate | The government has committed to capitalizing the JREEF and several other donors such as AFD and EBRD have expressed a strong willingness (as evidenced by EBRD's recent loans to the GAM in the areas of waste and light rail) to provide concessional financing for low-carbon investments. The application of UNDP's DEEI tool will assist policymakers in the GAM to systematically identify the barriers and associated risks which can hold back private sector investment in EE and propose specific de-risking measures to reduce the cost of capital. A preliminary application of the DEEI approach will be done at PPG phase.<br><br>In addition, GAM is providing incentives for the adoption of the Green Building Guidelines that include the Building Energy Codes in terms of increased floor area of new buildings so that building developers can fetch higher revenue by selling or renting the additional space.<br><br>As noted, the government has committed to capitalizing the JREEF and several other donors such as AFD and EBRD have expressed a string willingness (as evidenced by EBRD's recent loans to the GAM in the areas of waste and light rail – see next section) to provide concessional financing for low-carbon investments. A detailed investment analysis of the different measures to be promoted under the project will be undertaken at PPG phase to make sure that the risk/return | Project Steering Committee, Project Manager | No change |

| | | | | | |
|---|---|---|---|---|---|
| | | | profile is in line with local financing costs and sources. The application of UNDP's DREI tool will assist policymakers in the GAM to systematically identify the barriers and associated risks which can hold back private sector investment in EE and propose specific derisking measures to reduce the cost of capital. A preliminary application of the DEEI approach is discussed in Section 3.1.3. | | |

## 4.3 Social and environmental safeguards

121. UNDP's Social and Environmental Screening Procedure (SESP) has been applied to the project. The results are shown in **Annex F**, including an explanation of the different risks that have been identified and the mitigation measures that are proposed to mitigate them. The main results emanating from the SESP, and for which there may be cause for social and environmental grievances from project beneficiaries, stakeholders and the general public are related to the investment Component 4 of the project. It is pointed out that risk mitigation measures have been proposed in Section 4.2 to ensure that the risks are avoided, or at least minimized.

122. The project outputs that may potentially give rise to social and environmental grievances relate to on-the-ground implementation of project activities. **TABLE 14** identifies these outputs and describes the role of various parties in resolving any grievances.

**TABLE 14. Means of dealing with social and environmental grievances during project implementation.**

| Project output | Grievance resolution mechanism and role of parties |
|---|---|
| Output 4.1: 2 private sector residential buildings integrating best practice resource efficiency measures are supported.<br><br>Output 4.2: 2 existing public-sector buildings are retrofitted. | All social and environmental grievances from project beneficiaries and the general public impacted by the building works to be carried out under Component 4 will be reported to the Project Manager (PM) for further action. As far as is practicable, decisions regarding the most appropriate actions to take to remedy any grievance will be made by the PMU (see **FIGURE 8**) and the GAM. Matters of an extraordinary kind will be dealt with by the PSC.<br><br>Project beneficiaries and the general public will have the following avenue for reporting grievances: all construction sites benefiting from the financial support of the GEF-financed project will be sign posted with clear indication of the contact details (postal address, email address and phone contact details) of the PMU and the relevant department in GAM for communicating social and environmental grievances.<br><br>In the event that the social and environmental grievances cannot be dealt with appropriately by the PMU or GAM, the PM will refer the grievance to the PSC for consideration and action.<br><br>The roles and responsibilities of the various parties and positions featuring in the organizational structure of the project is discussed in Section 7 and listed in **TABLE 11**. |

Environmental and social grievances will be reported to the GEF in the annual PIR.

## 4.4 Sustainability and Scale-up

123. Then project's sustainability is underpinned by the fact that as a category of GHG mitigation options, EE in the built environment has been validated as being the most cost-effective abatement measure (by

category) in the country (see more below). As discussed in **Annex SA2**, EE interventions in the Jordanian building sector benefit from the highest energy-saving potential, the greatest political attention, and achieve the maximum possible influence in the target group. Energy efficient street lighting similarly has a high level of visibility and social acceptance; it is technically straightforward to implement; and already builds on the work started by several other partners. Jordan suffers from a huge energy import bill and is completely reliant on, and vulnerable to, the global energy market. Energy prices in Jordan are among the highest in the region and Jordan's Cabinet approved a plan to increase electricity tariffs for most segments until 2017 to better reflect the costs of generation. All of these trends and facts mean that from both a Government and end-user perspective, the chosen project interventions can be expected to receive a high degree of acceptance from all stakeholders and have a positive profile in terms of their social, operational and financial sustainability.

124. The urban NAMA and accompanying investment plan will support scaling-up of EE in buildings in GAM based on the lessons learned in implementing the project. Through the compilation and dissemination of lessons-learned to other cities in Jordan, the urban NAMA can potentially be scaled up to other cities in Jordan. Focusing on the largest city in Jordan – i.e. Amman – provides the measure of scale and visibility to hopefully extend similar measures to other cities (post-project) and begin the process of decarbonizing the built environment of all of Jordan's urban areas. The interventions chosen for this project have excellent replication potential for the neighboring Greater Zara Municipality and Irbid Governorate, the second largest metropolitan population in Jordan after Amman with a population of around 1.1 million (located about 70 km north of Amman on the northern ridge of the Gilead).

125. The project is innovative in the sense that it includes more general upstream policy support for urban planning and monitoring frameworks that systematically address resource efficiency issues across the continuum of water, energy and waste sectors in the GAM, as well as more customized components designed to address specific barriers in the municipal buildings and street lighting sub-sectors. Because of budget constraints (the project originally applied for additional set-aside funding under the GEF Sustainable Cities IAP), the choice of sub-sectors for targeted support were narrowed down to buildings and street lighting (it was originally hoped to additionally focus on water and waste interventions) but the "systematic" and "resource efficiency" aspects of the project are nevertheless preserved by virtue of the upstream planning activities and the fact that many of the approaches and tools put forth for the chosen sub-sectors can in the future be replicated for other areas (waste, water-saving technologies, transport, etc.).

126. The project will also have a market transformation impact in terms of supporting a low carbon economy for the country. In terms of both GHG reductions and local benefits[51], the project has the potential to catalyze transformational change and make a major contribution towards achievement of the National Energy Efficiency Action Plan (NEEAP) and to the offsetting of incremental energy demand from the Syrian Crisis. The project is not your conventional energy efficiency project in the sense that it is embedded in the broader umbrella of a push towards a sustainable architecture by GAM authorities and the fact that many of the interventions are specifically customized to the needs of the GAM and alleviating the exceptional circumstances faced by the city. As already noted, additional Government subsidies on food, gas, water and electricity for Syrian refugees and accelerated infrastructure depreciation from the crisis are costing the Government more than US$ 650 million a year, with a sizeable portion of that going to support services in the GAM. The project is very relevant to the current national context since expediting and expanding key energy efficiency and water conservation measures could potentially meet all of the new energy demand

[51] The project will also enhance sustainable development through minimizing dependence on imported energy, minimising energy costs to the GAM and the larger economy, creating new employment opportunities and improving the local environment. The sustainable development and socioeconomic development impacts of the project will be substantial and multi-faceted.

from the Syrian crisis and would be a strategic approach that does not build in new import-dependence as with oil/gas, thereby putting the city and country on a firm low-carbon pathway.

## 4.5 Financial analysis

127. Two financial modeling exercises have been carried out to investigate the return on investments in envelope thermal insulation. The model case is for a residential building with a floor area of 130 $m^2$, which is a typical lodging for a Jordanian family living in Amman. Such a house has three bedrooms (one master bedroom and two bedrooms for children), one living room, a reception area, one kitchen and two bathrooms. In both modeling exercises insulation is applied to the walls, roof and windows (i.e. glazing) of the building. Three different insulation scenarios have been analyzed, namely the building with: (1) no insulation, (2) poor insulation, and (3) good insulation – i.e. insulation that gives a U-value according to the Thermal Insulation Code. Further details about the building parameters and the U-value used for wall, window and roof in the three insulation scenarios are provided in **Annex SA7**.

128. The first financial exercise has adopted the simple Heating Degree Day (HDD) approach. In the present case, the HDD approach allows the calculation of the energy required to satisfy the thermal comfort (22°C) inside a building.[52] It is assumed that the entire apartment or house is heated around the clock during the winter season – i.e. for a total of 1,256 HDD per year. The analysis assumes a diesel-fired central heating system with a thermal efficiency of 85%.

129. The results of the analysis are shown in **TABLE 15**. Using the upfront cost of insulation and corresponding savings on energy bill, the payback period is found to be between 2.5 years for poor insulation and 3.3 years for good insulation. The calculation details are given in **Annex SA7**. Given that the lifetime of a residential building is at least 40 years in the MENA region,[53] the short payback period reveals the financial viability of building envelope insulation. This is particularly interesting since the insulation does not have any maintenance cost, and when fitted properly to be protected against damage, building insulation can have a lifespan as long as that of the residential building.[54]

**TABLE 15. Summary of results of the simple HDD approach.**

| Parameter | No insulation | Poor insulation | Good insulation |
|---|---|---|---|
| Heat load (W) | 11,466 | 6,868 | 3,740 |
| Heat loss (W/m2) | 88.2 | 52.8 | 28.8 |
| Cost of insulation, JD | na | 2,450 | 4,410 |
| Savings on energy bill, JD/year[55] | na | 981 | 1341 |
| Payback period, year | na | 2.5 | 3.3 |

na – not applicable

130. Although space heating is a more pressing problem for households than cooling during summer, the above analysis can be extended to include Cooling Degree Days (CDD). Since a typical residential building in Amman does not have centralized air conditioning, households usually opt to cool rooms selectively. A typical example would be the cooling of say one or two rooms using separate split air conditioners of a 1

[52] The thermal comfort is equated to the base temperature – i.e. the outside temperature above which no heating is required.

[53] M. Krarti and P. Ihm. (2016) *Evaluation of net-zero energy residential buildings in the MENA region*, Sustainable Cities and Societies 22, 116-125.

[54] http://www.improvementcenter.com/insulation/insulation-can-it-last-as-long-as-your-home.html - accessed 19 January 2017.

[55] This is calculated relative to the cost of fuel when there is no insulation (1,773 JD/year).

to 2 tonne capacity. Once installed, the building envelope insulation also reduces the cooling load required for maintaining thermal comfort inside the building during summer by reducing heat transfer from the surroundings. Hence, the adoption of building insulation translates directly in lower consumption of electricity needed for cooling, resulting in savings on electricity bills. For the case where two split air conditioners of 2 tonne capacity are used, the reduction in electricity bill, of about 150-200 JD per annum, associated with this reduction in cooling load improves the payback period of the poor insulation to be around 2.2 years, and 3.0 years for good insulation. For more details, please see **Annex SA7**.

131. Since most residential buildings in Amman do not have a central heating system with necessary ducting system in place, and because heating during winter is not carried out around the clock, the above modeling exercise has been refined as follows: one room is heated using a kerosene or LPG fired stove(s) and another using air conditioning in reverse mode, as heat pump, for 6-8 hours per day. The cooling done in summer remains unchanged. In this case, the payback period would be much longer, i.e. about 10 years and 15 years for poor and good insulation, respectively. Given the long lifespan of houses and insulation (>40 years), these relatively longer payback times still reveal the financial viability of adopting thermal insulation in residential buildings. **Annex SA7** gives details of the calculations as well as results of sensitivity analyses.

## 5. PROJECT RESULTS FRAMEWORK

**TABLE 16: Project results framework.**

| | | | | | |
|---|---|---|---|---|---|
| ***Intended Outcome as stated in the UNDAF/Country Programme Results and Resources Framework:***<br>*Government and national institutions have operationalized mechanisms to develop and implement strategies and plans targeting key cultural, environmental and Disaster Risk Reduction issues (including a transition to a Green Economy) at national and sub-national levels.* | | | | | |
| ***Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets:***<br>- *# of new buildings implementing Green building codes; no active Green building codes; 2-3 new Green building implementing green codes at subnational level*<br>- *# of municipalities that have capacities to undertake land use planning in sustainable manner; 0; 5*<br>- *# of municipalities having planning capacity in eco-city management; 0; 12* | | | | | |
| ***Applicable Outputs from the 2014 – 2017 UNDP Strategic Plan:***<br>*Output 1.5. Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy).* | | | | | |
| ***Applicable Output Indicators from the UNDP Strategic Plan Integrated Results and Resources Framework:***<br><br>*Output 1.5: indicator 1.5.1: Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women.*<br>*Output 1.5: indicator 1.5.2: Extent of change in: a) energy efficiency, and/or b) modern energy coverage by users and specific sectors.* | | | | | |
| | ***Objective and Outcome Indicators*** | ***Baseline[56]*** | ***Mid-term Target*** | ***End of Project Target*** | ***Assumptions[57]*** |
| ***Project Objective:***<br>*To assist the Greater Amman Municipality (GAM) improve the quality of life for its citizens and comply with the National Energy Efficiency Action Plan (NEEAP) via support for more sustainable resource-efficient urban planning and targeted low-carbon interventions in the municipal buildings and street lighting sub-sectors.* | *Direct project $CO_2$ emission reductions from the range of interventions proposed by the project, $tCO_{2e}$ [58]* | *0* | *~255* | *~1,602* | *Continued political commitment to enforce the implementation of the Thermal Insulation Code and to develop retrofit guidelines for existing buildings.*<br><br>*The successful implementation of the project is premised on the assumptions that: (a) GAM will develop the capacity to inspect the construction of new buildings according to the Thermal Insulation Code; (b) incentives will be provided to* |

[56] Baseline, mid-term and end of project levels must be expressed in the same neutral unit of analysis as the corresponding indicator.
[57] Risks must be outlined in the Feasibility section of this project document.
[58] GHG reduction measures of the project emanate from increasing the energy efficiency of new buildings through the application of the Building Thermal Insulation Code, and by retrofitting old buildings using thermal insulation retrofitting guidelines that will be developed by the project, as well as through the implementation of water efficient devices and fixtures in all the 6 buildings discussed in section 3.1.4.

| | | | | | |
|---|---|---|---|---|---|
| | | | | | *building developers to adopt codes;*<br><br>*Project MRV reports are completed on specific project interventions (i.e. combination of new and existing private and public buildings).* |
| | *Energy saved through application of Thermal Insulation Code and water efficient fixtures* | *0* | *- 1,780 GJ (from diesel avoided)*<br>*- 218 MWh (electricity saved)* | *- 7,742 GJ (from diesel avoided)*<br>*- 1,822 MWh (electricity saved)* | *Energy savings is dependent on: (a) GAM developing and retaining the capacity to inspect the construction of new buildings according to the Thermal Insulation Code; (b) incentives are provided to building developers to adopt codes;*<br><br>*Project MRV reports are completed on specific project interventions (i.e. combination of new and existing private and public buildings).* |
| | *Number of gender-disaggregated beneficiaries benefiting from investments in building envelope thermal insulation* [59] | *0* | *94,000*[60] *(of which at least 40% for women)* | *153,000 (of which at least 40% for women)* | *Project reports are completed on social impact analysis of project interventions.* |
| ***Outcome 1***<br>*Planning and monitoring frameworks in place to foster accelerated low-carbon development in GAM and benchmark progress against established international standards* | *Number of resources quantified in GAM inventory using best practice methodologies by the Amman Urban Observatory* | *0* | *3* [61] | *3* | *Collaboration with IAP Cities project is established for the adoption of best practice methodologies for measuring energy and materials throughput at the municipal level.*<br><br>*Reporting of energy and water* |

[59] The number of beneficiaries are calculated as: (1) the annual number of persons using the Al Hussein Cultural Centre; (2) the number of persons living in the low-cost housing that is retrofitted with insulation under Component 4, and (3) the expected number of persons that are expected to use the private-sector commercial buildings supported by the GEF-financed project under Component 4.

[60] This is approximately 61.5% of the final number of beneficiaries.

[61] The target is the following resources used in GAM annually: (1) energy (electricity and fossil combustibles), (2) water, and (3) municipal solid waste. The inventory for solid waste will also cover the generation of the following waste sub-categories: (i) hazardous; and (ii) electrical and electronic waste.

| | | | | | |
|---|---|---|---|---|---|
| | | | | | *used and waste generated on an annual basis to the WCCD under the ISO 37120.* |
| | *Number of plans and strategies that set medium-to-long-term targets for sustainable use of energy and water, and the sustainable management of solid waste in GAM*[62] | *0* | - 1 Sustainability Plan<br>- 1 Financing Strategy<br>- 1 Communications Plan | Plans and Strategy updated where necessary | *Political commitment of GAM management to develop plans and strategy, and to implement them.*<br><br>*The refugee crisis is under control or manageable so as not to take away the attention and resources need to design, implement, monitor & evaluate the Sustainability Plan.* |
| ***Outcome 2***<br>*The enabling conditions, methodologies and tools in GAM for enforcing regulatory frameworks for EE buildings and street lighting strengthened* | *Number of new department established and operational in GAM* | *0* | *1 (at least 30% of staff are women)* | *1 (at least 30% of staff are women)* | *Commitment of GAM to set up SDD and providing it with the necessary resources for operating.*<br><br>*A gender-sensitive approach is used to staff the SDD.* |
| | *Number of updated Building Codes and newly developed 'Retrofit Building Guidelines'* | *0* | *- 2 updated Energy Building Codes*<br>*- 2 newly developed 'Retrofit Building Guidelines'* | *- 2 updated Energy Building Codes*<br>*- 4 newly developed 'Retrofit Building Guidelines'* | *Political commitment for enhancing energy efficiency in buildings at the national and municipal levels.*<br><br>*Jordan National Building Council is fully integrated in the project.* |
| | *Number of ESCOs accredited and capacitated by programme* | *0* | 3 | 5 | *Adequate demand for ESCOs in a nascent market for energy efficiency.*<br><br>*Collaboration with USAID-funded ESCB project is established.* |
| ***Outcome 3*** | *Number of standardized baselines for* | *0* | *1* | *4* [63] | *Availability of reliable and* |

[62] The implementation of the Sustainability Plan will benefit the entire population of GAM.

[63] This will include the establishment of the following standardized baselines by the end of Year 3: (i) grid emission factor for the electricity system of Jordan; (ii) consumption of liquid fossil combustible for heating in buildings, including sampling methodology for verification; and (iii) calculating the carbon embodied in water supplied to buildings in GAM, including a methodology to account for the effect of physical water loss through leakages in the piping network.

| | | | | | |
|---|---|---|---|---|---|
| *An integrated climate monitoring and finance framework is established for the development of urban NAMAs.*<br><br>*Appropriate financial de-risking tools are identified and supported to promote adoption of EE measures in buildings attached to MRV systems.* | *calculating emission reductions in MRV system* | | | | *accurate data.*<br>*Documentation of the 3 established standardized baselines and MRV system.* |
| | *Number of policy and financial de-risking instruments identified and quantified* | *0* | *- 4 policy instruments identified and quantified*<br>*- 3 financial instruments identified and quantified* | *- at least 2 policy instruments implemented*<br>*- at least 1 financial instrument implemented* | *UNDP's DEEI methodology has been fully developed and validated.*<br><br>*Political commitment of all stakeholders (municipal and national) to implement instruments using the evidence-based approach afforded by the DEEI methodology.* |
| | *Gender-disaggregated population covered by a registered UNFCCC NAMA for energy efficient buildings applying the Thermal Insulation Code and retrofit guidelines*[64] | *0* | *0* | *Total population of GAM at the end of the project* [65] | *NAMA registration is documented.*<br><br>*There are local experts with sufficient expertise and understanding of concepts to develop the NAMA.* |
| ***Outcome 4***<br>*Selected proof-of-concept mitigation interventions* | *Area of building envelope insulated (differentiated between new and existing buildings)* | *0* | - 2,125 $m^2$ (new building)<br>- 6,140 $m^2$ (old buildings) | - 2,125 $m^2$ (new building)<br>- 9,988 $m^2$ (old buildings) | *Physical verification of buildings.* |
| | *Percentage of GAM lighting adopting smart usage system* | *0* | *30%* | *100%* | *Physical verification of street lighting system.* |
| | *Number of standalone PV outdoor/street lighting units installed* | *0* | *570* | *570* | *Physical verification of PV lighting units.* |

[64] This indicator will be measured as the male and female population of GAM taking into account projected population growth rate.
[65] This NAMA will initially cover GAM but it will have the potential for scaling up to other municipalities in Jordan using the project's lessons learned – i.e. Output 3.5.

## 6. MONITORING AND EVALUATION (M&E) PLAN

132. Project-level monitoring and evaluation will be undertaken in compliance with standard UNDP requirements as outlined in the UNDP POPP and UNDP Evaluation Policy. Though these UNDP requirements are not detailed in this section of the project document, the UNDP Country Office will ensure UNDP M&E requirements are met in a timely fashion and to high quality standards. The additional and mandatory GEF-specific M&E requirements as outlined in this section will be undertaken in accordance with the GEF M&E policy and GEF guidance materials. In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management, and the exact role of project target groups and other stakeholders in project M&E activities, will be finalised during the Inception Workshop and will be detailed in the Inception Report. This will include the exact role of project target groups and other stakeholders in project M&E activities including the GEF Operational Focal Point and national/regional institutes assigned to undertake project monitoring. The GEF Operational Focal Point will strive to ensure consistency in the approach taken to the GEF-specific M&E requirements (notably the GEF Tracking Tools) across all GEF-financed projects in the country. This could be achieved for example by using one national institute to complete the GEF Tracking Tools for all GEF-financed projects in the country, including projects supported by other GEF Agencies.

133. **Oversight and monitoring responsibilities:**
Project Manager The primary responsibility for day-to-day project implementation and regular monitoring rests with the Project Manager. The Project Manager will develop annual work plans based on the multi-year work plan included in the annexes, including annual targets at the output level to ensure the efficient implementation of the project. The Project Manager will ensure that the standard UNDP and GEF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for reporting (i.e. GEF PIR), and reporting to the Project steering Committee (PSC) at least once a year on project progress. The Project Manager will inform the PSC and the UNDP Country Office of any delays or difficulties as they arise during implementation, including the implementation of the M&E plan, so that the appropriate support and corrective measures can be adopted. The Project Manager will also ensure that all project staff maintains a high level of transparency, responsibility and accountability in monitoring and reporting project results.

134. Project Board/ Project Steering Committee: The Project Board will take corrective action as needed to ensure the project achieves the desired results. The Project Board will hold project reviews to assess the performance of the project and appraise the Annual Work Plan for the following year. In the project's final year, the Project Board will hold an end-of-project review to capture lessons learned and discuss opportunities for scaling up and to highlight project results and lessons learned with relevant audiences. This final review meeting will also discuss the findings outlined in the project terminal evaluation report and the management response.

135. Project Implementing Partner: The Implementing Partner is responsible for providing any and all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary and appropriate. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes, and is aligned with national systems so that the data used by and generated by the project supports national systems.

136. The UNDP Country Office will support the Project Manager as needed, including through annual supervision missions. The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the UNDP POPP. This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; that annual targets at the output level are developed, and monitored and reported using UNDP corporate systems; and updating the UNDP gender marker on an annual basis based on progress reported in the GEF PIR and UNDP ROAR reporting. Any quality concerns flagged by the process must be addressed by project management. Additional M&E and

implementation quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Unit as needed. The project target groups and stakeholders, including the GEF Operational Focal Point, will be involved as much as possible in project-level M&E.

137. **Audit Clause**: The project will be audited according to UNDP Financial Regulations and Rules, and applicable audit policies on NIM-implemented projects.

## 6.1 Additional GEF monitoring and reporting requirements

138. Inception Workshop and Report: A project inception workshop will be held within 2 months after the project document has been signed by all relevant parties to: a) re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation; b) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms; c) review the results framework and discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E plan; d) Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP in M&E; e) Update and review responsibilities for monitoring the various project plans and strategies, including the risk log; SESP, Environmental and Social Management Plan and other safeguard requirements; project grievance mechanisms; the gender strategy; the knowledge management strategy, and other relevant strategies, f) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; g) plan and schedule PSC meetings and finalize the first year annual work plan. The Project Manager will prepare the inception report no later than one month after the inception workshop. The final inception report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Advisor, and will be approved by the PSC.

139. GEF Project Implementation Report (PIR): The Project Manager, the UNDP Country Office and the UNDP-GEF Regional Technical Advisor will provide objective input to the annual GEF PIR covering the reporting period July (previous year) to June (current year) for each year of project implementation. The Project Manager will ensure that the indicators included in the project results framework are monitored annually well in advance of the PIR submission deadline and are reported on accordingly in the PIR. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR. The PIR that is submitted to the GEF each year must also be submitted in English and shared with the PSC. The UNDP Country Office will coordinate the input of the GEF Operational Focal Point and other stakeholders to the PIR. The quality rating of the previous year's PIR will be used to inform the preparation of the subsequent PIR. The project's terminal PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the PSC during an end-of-project review meeting to discuss lessons-learned and opportunities for scaling-up.

140. Lessons learned and knowledge generation: Results from the project will be disseminated within and beyond the project intervention area through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to the project. The project will identify, analyse and share lessons learned that might be beneficial to the design and implementation of similar projects and disseminate these lessons widely. There will be continuous information exchange between this project and other projects of similar focus in the same country, region and globally.

141. GEF Focal Area Tracking Tools: In line with its objective and the corresponding GEF Focal Area (Climate Change Mitigation), this project will prepare the following GEF Tracking Tool: Climate Change Mitigation Tracking Tool. The baseline/CEO Endorsement GEF Focal Area Tracking Tool – submitted in Annex to this project document – will be updated by the Project Manager/Team and shared with the mid-term review consultants and terminal evaluation consultants before the required review/evaluation missions take place.

The updated GEF Tracking Tool will be submitted to the GEF along with the completed Mid-term Review report and Terminal Evaluation report.

142. Mid-term Review (MTR): An independent mid-term review process will begin after the second PIR has been submitted to the GEF, and the final MTR report will be submitted to the GEF in the same year as the third PIR. The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the final MTR report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center (ERC). As noted in this guidance, the evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. The GEF Operational Focal Point and other stakeholders will be involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate. The final MTR report will be available in English and will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Advisor, and approved by the PSC.

143. Terminal Evaluation (TE): An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terminal evaluation process will begin three months before operational closure of the project allowing the evaluation mission to proceed while the project team is still in place, yet ensuring the project is close enough to completion for the evaluation team to reach conclusions on key aspects such as project sustainability. The Project Manager will remain on contract until the TE report and management response have been finalized. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center. As noted in this guidance, the evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. The GEF Operational Focal Point and other stakeholders will be involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate. The final TE report will be cleared by the UNDP Country Office and the UNDP-GEF Regional Technical Adviser, and will be approved by the Project Board. The TE report will be publically available in English on the UNDP ERC.

144. The UNDP Country Office will include the planned project terminal evaluation in the UNDP Country Office evaluation plan, and will upload the final terminal evaluation report in English and the corresponding management response to the UNDP Evaluation Resource Centre (ERC). Once uploaded to the ERC, the UNDP Independent Evaluation Office will undertake a quality assessment and validate the findings and ratings in the TE report, and rate the quality of the TE report. The UNDP IEO assessment report will be sent to the GEF Independent Evaluation Office along with the project terminal evaluation report.

145. The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations undertaken by the UNDP Independent Evaluation Office and/or the GEF Independent Evaluation Office.

146. Final Report: The project's terminal PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

**Mandatory GEF M&E Requirements and M&E Budget:**

**TABLE 17: GEF M&E requirements and M&E budget.**

| GEF M&E requirements | Primary responsibility | Indicative costs to be charged to the Project Budget[66] (US$) | | Time frame |
|---|---|---|---|---|
| | | GEF grant | Co-financing | |
| **Inception Workshop** | UNDP Country Office | US$ 5,000 | None | Within two months of project document signature |
| **Inception Report** | Project Manager | None | None | Within two weeks of inception workshop |
| **Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP** | UNDP Country Office | None | None | Quarterly, annually |
| **Monitoring of indicators in project results framework** | Project Manager and Administrative Assistant | To be carried out as part of the Annual Work Plan's preparation. | None | Annually |
| **GEF Project Implementation Report (PIR)** | Project Manager and UNDP Country Office and UNDP-GEF team | None | None | Annually |
| **NIM Audit as per UNDP audit policies** | UNDP Country Office | Per year: US$ 3,000 (i.e. a total of US$ 15,000) | None | Annually or other frequency as per UNDP Audit policies |
| **Supervision missions** | UNDP Country Office | None[67] | US$ 10,000 (i.e. total of US$ 50,000) | Annually |
| **Oversight missions** | UNDP-GEF team | None[66] | US$ 10,000 (i.e. total of US$ 50,000) | Troubleshooting as needed (assumed annually) |
| **Knowledge management (spread around the four outcomes as explained in the project approach – Section II)** | Project Manager supported by the Administrative Assistant | To be carried out as part of the Annual Work Plan's preparation. | None | On-going |
| **GEF Secretariat learning missions/site visits** | Project Manager and UNDP-GEF team | None | *None* | To be determined |
| **Mid-term GEF Tracking Tool to be updated** | Project Manager and External Consultants | To be completed as part of the MTR | None | Before mid-term review mission takes place |
| **Independent Mid-term Review (MTR)** | UNDP Country Office and Project team; UNDP-GEF team and External Consultants | US$ 39,100 | None | Between 2nd and 3rd PIR. |
| **Final GEF Tracking Tool to be updated** | Project Manager and External Consultants | To be completed as part of the TE | None | Before terminal evaluation mission takes place |
| **Independent Terminal Evaluation (TE) included in UNDP evaluation plan** | UNDP Country Office and Project team and UNDP-GEF team | US$ 40,920 | None | At least three months before operational closure |
| **TOTAL indicative COST** Excluding project team staff time, and UNDP staff and travel expenses | | US$ 100,020 | US$ 100,000 | |

[66] Excluding project team staff time and UNDP staff time and travel expenses.

[67] The costs of UNDP Country Office and UNDP-GEF's participation and time are charged to the GEF Agency Fee.

# 7. GOVERNANCE AND MANAGEMENT ARRANGEMENTS

## 7.1 Roles and responsibilities of the project's governance mechanism

147. The project will be implemented following UNDP's national implementation modality (NIM), according to the Standard Basic Assistance Agreement (SBAA) between UNDP and the Hashemite Kingdom of Jordan, and the Country Programme Action Plan (CPAP). The **Implementing Partner** for this project is the Greater Amman Municipality (GAM). The Implementing Partner is responsible and accountable for managing this project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of UNDP resources. The Implementing Partner is responsible for: Approving and signing the multiyear workplan; Approving and signing the combined delivery report at the end of the year; and, Signing the financial report or the funding authorization and certificate of expenditures.

148. The project organisation structure is shown in **FIGURE 8**.

149. The **Project Steering Committee** is responsible for making by consensus, management decisions when guidance is required by the Project Manager, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, Project Steering Committee decisions should be made in accordance with standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Steering Committee, the final decision shall rest with the UNDP Programme Manager. The terms of reference for the Project Steering Committee are contained in **Annex E**. The Project Steering Committee is comprised of the representatives of the following institutions: the PSC will be chaired by the Ministry of Planning and International Cooperation (MoPIC). The PSC will comprise the Deputy City Manager, Planning & Economic Development of GAM, the Jordan National Building Council (JNBC, under the aegis of the Minstry of Public Works and Housing), the Ministry of Energy and Mineral Resources (MEMR), the Ministry of Environment (MoE), and a representative of the private sector (e.g. member of the Jordan Housing Developers Association), as well as the Project Manager. If required, representatives of the project stakeholders such as JGBC, RSS, NERC, GIZ, Cowater and AfD, can be invited to the PSC meetings at the discretion of the PSC. UNDP will participate as the GEF Implementing Agency. Other members can be invited at the decision of the PSC on an as-needed basis, but taking due regard that the PSC remains sufficiently lean to be operationally effective. The final list of PSC members will be completed at the outset of project operations and presented in the Inception Report by taking into account the envisaged role of different parties in the PSC. The Project Manager will participate as a non-voting member in the PSC meetings and will also be responsible for compiling a summary report of the discussions and conclusions of each meeting.

150. The **Project Manager** will run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the PSC. The Project Manager function will end when the final project terminal evaluation report, and other documentation required by the GEF and UNDP, has been completed and submitted to UNDP (including operational closure of the project).

151. The **project assurance** role will be provided by the Head of the Energy and Environment Unit, UNDP CO. Additional quality assurance will be provided by the UNDP Regional Technical Advisor as needed

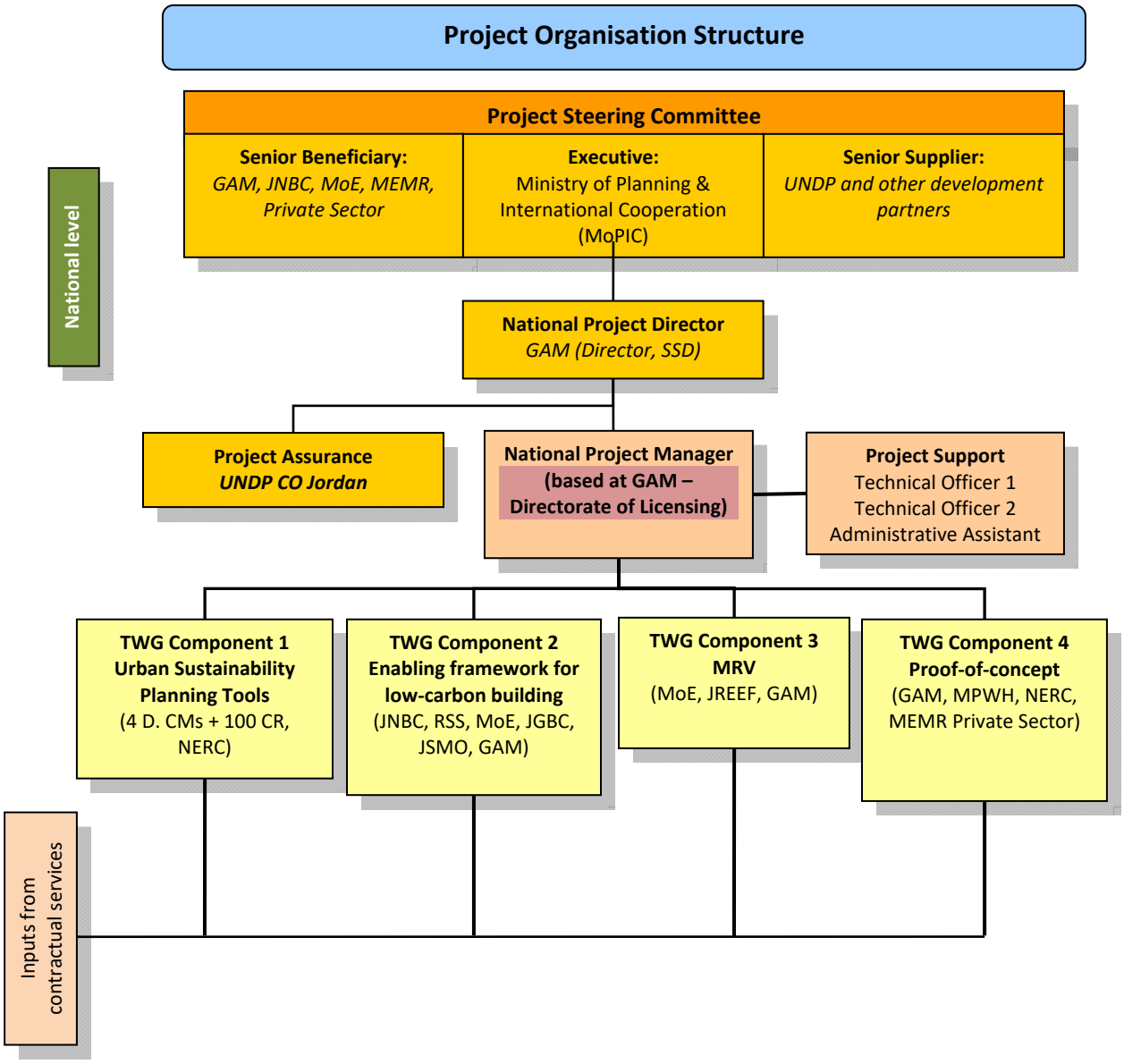


**FIGURE 8: Project organization structure.**

152. Governance role for project target groups. The composition of the PSC has been determined so that all target groups are represented in the highest governance structure of the project. While recognising that not all interested target audience can be represented on the PSC, the project makes space for a larger number of individuals from target groups to participate in the project implementation through the four technical working groups (TWGs) that will be established for each component of the project. The TWGs will be set up to review the operational policies and progress on project outputs, provide project assurance, and provides regular reports to the PSC. In this capacity, the TWGs will support the PSC in monitoring functions and delivery of project outputs, ensuring that the project is on-track towards achieving the overall outcomes. As shown in **FIGURE 8**, different target groups are represented in TWGs depending on their involvement in the project. Also, the TWGs (and PSC) will be constituted from the cohort of stakeholders listed in **TABLE 11** (see Section 3.3.1). Additional specific responsibilities of the TWGs will include, but are not limited to,

ensuring: beneficiary needs and expectations are being met or managed; risks are being controlled; the project remains viable; internal and external communications are working; quality management procedures are properly followed; and that the PSC decisions are followed and revisions are managed in line with procedures laid-down in the project implementation manual.

### 7.2 Agreement on intellectual property rights and use of logo on the project's deliverables

153. In order to accord proper acknowledgement to the GEF for providing funding, the GEF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF.

### 7.3 Project management

154. A Project Management Unit (PMU) under the overall guidance of the National Project Director operating on behalf of the Project Steering Committee will carry out the day-to-day management of the project. The PMU will be established within the Directorate of Licensing, GAM, and will coordinate its work with the PSC. The Project Manager will report to UNDP, the implementing partner and the PSC. The PMU will be supported by two Technical Officers and an Administrative Assistant. The Terms of Reference of the key project personnel are presented in **Annex E**. The project personnel will be selected on a competitive basis in accordance with the relevant UNDP rules and procedures and in consultation with the UNDP-GEF Regional Technical Advisor. The Project Manager and the TWGs will be supported by international and national experts taking the lead in the implementation of specific technical assistance components of the project.

155. For successfully reaching the objective and outcomes of the project, it is essential that the progress of different project components be closely monitored, both by the key local stakeholders and authorities as well as by the project's international experts, starting with the finalisation of the detailed, component-specific work plans and implementation arrangements and continuing through the project's implementation phase. The purpose of this monitoring is to facilitate early identification of possible risks to successful completion of the project together with adaptive management and early corrective action, when needed.

## 8. FINANCIAL PLANNING AND MANAGEMENT

156. The total cost of the project is *US$ 24,655,000.* This is financed through a GEF grant of *US$ 2,640,000*[68], and *US$ 22,015,000* in parallel co-financing. UNDP, as the GEF Implementing Agency, is responsible for the execution of the GEF resources and the cash co-financing transferred to UNDP's bank account only.

157. Co-financing. The planned co-financing will be used as shown in **TABLE 18**. **Annex J** shows the letters of co-financing. The actual realization of project co-financing will be monitored during the mid-term review and terminal evaluation process, and will be reported to the GEF.

**TABLE 18: Co-financing and risk mitigation measures.**

| Co-financing source | Co-financing type | Co-financing amount | Planned Outputs | Risks | Risk Mitigation Measures |
|---|---|---|---|---|---|
| Recipient Government - National | Cash | **800,000** | → Output 2.3: Update of the existing Building Codes and development of a 'Retrofit Building Guidelines' to make upgrades more acceptable. | Low level of cooperation between institutions at national and | The Project Manager will ensure the implementation, as well as the |

[68] This grant excludes the GEF Agency Fee of US$ 250,800.

| Co-financing source | Co-financing type | Co-financing amount | Planned Outputs | Risks | Risk Mitigation Measures |
|---|---|---|---|---|---|
| | | | → Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates.<br>→ Output 3.1: Development of an urban MRV system for (i) Building Energy Codes, and (ii) energy efficient street lighting for determination of emission reductions from investments.<br>→ Output 4.2: 4 existing public-sector buildings integrating best practice resource efficient/technology measures supported. | local levels, and weak coordination and information exchange mechanism<br><br>Risk - Low | effectiveness of the communication management strategy for the project and parallel interventions. |
| Recipient Government - National | In-kind | **3,200,000** | → Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.<br>→ Output 2.3: Update of the existing Building Codes and development of a 'Retrofit Building Guidelines' to make upgrades more acceptable.<br>→ Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes<br>→ Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plan for existing and new buildings, and street lighting<br>→ Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to promote investments in Building Energy Codes.<br>→ Output 3.4: Identification and quantification of the effectiveness of different policy and financial de-risking instruments for EE buildings using UNDP's de-risking methodology (DEEI).<br>→ Output 3.5: Lessons learnt, experiences and best practices related to the project are compiled and disseminated in other cities of Jordan and MENA countries. | Low level of cooperation between institutions at national and local levels, and weak coordination and information exchange mechanism<br><br>Risk - Low | The project has developed an effective stakeholder's engagement strategy to ensure broad buy-in at all levels that is expected to support project success during implementation. Project results will be monitored by the PSC. The Project Manager will be responsible for implementing the project stakeholder management strategy and, where relevant, will escalate issues and risks to the PSC to mitigate adverse impacts. |
| Recipient Government – Municipality (GAM) | Cash | **9,000,000** | → Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.<br>→ Output 1.2: Quantification of all | Low implementation capacity at municipal level | The capacity development interventions of the project will bridge identified |

| Co-financing source | Co-financing type | Co-financing amount | Planned Outputs | Risks | Risk Mitigation Measures |
|---|---|---|---|---|---|
| | | | energy, water and material flows in the GAM.<br>→ Output 1.3: Institutional strengthening (Amman Urban Observatory) for data analysis and reporting.<br>→ Output 2.1: A new SDD set-up within GAM.<br>→ Output 2.2: Enforcement capabilities of new SDD strengthened as regards compliance with Energy Building Codes.<br>→ Output 4.2: 4 existing public-sector buildings integrating best practice resource efficient/technology measures supported.<br>→ Output 4.3: Updated EE Lighting Code and smart usage system in place for all GAM lights.<br>→ Output 4.4: Stand-alone PV street lighting installed in GAM using the most energy efficient and site appropriate lighting technology available (e.g. LEDs) | Risk – Low<br><br>All the cash co-financing is accruing from the recurrent and capital expenditure budget of GAM that are fully financed. | capacity implementation gap at the municipal level. |
| Recipient Government – Municipality (GAM) | In-kind | **2,850,000** | → Output 1.4: Assessment and costing of awareness-raising campaigns for the Sustainability Plan.<br>→ Output 2.1: A new SDD set-up within GAM.<br>→ Output 3.1: Development of an urban MRV system for (i) Building Energy Codes, and (ii) energy efficient street lighting for determination of emission reductions from investments.<br>→ Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plan for existing and new buildings, and street lighting.<br>→ Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported.<br>→ Output 4.2: 4 existing public-sector buildings integrating best practice resource efficient/technology measures supported.<br>→ Output 4.4: Stand-alone PV street lighting installed in GAM using the most energy efficient and site appropriate lighting | The in-kind contribution relates to the time input in the project, administration of the new SDD, and hosting the PMU. Given the high visibility that the UNDP-GEF project affords GAM, it is highly unlikely that the in-kind contribution will not materialize. | In addition to the letter of co-financing, GAM management has provided a letter of support/intent for the setting up of the SDD.<br><br>Engagement of GAM in the GEF-financed, World Bank-implemented GPSC provides GAM with an unprecedented opportunity to showcase its sustainability efforts, and hence provides a strong motivation to actively promote the project. |

| Co-financing source | Co-financing type | Co-financing amount | Planned Outputs | Risks | Risk Mitigation Measures |
|---|---|---|---|---|---|
| | | | technology available (e.g. LEDs) | | |
| Civil Society/NGO | In-kind | **15,000** | → Output 2.6: Development and dissemination of an online tool for carrying out comparative socio-economic and environmental analysis of buildings using life-cycle methodology.<br>→ Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates.<br>→ Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes.<br>→ Output 4.2: 4 existing public-sector buildings integrating best practice resource efficient/technology measures supported. | Low level engagement with the project.<br><br>Risk - low<br><br>The in-kind contribution relates to the time input in the project and knowledge sharing. The letters of co-financing and mutual synergies make it unlikely that project partners will not collaborate with the UNDP-GEF project. | Same as above. |
| Private Sector | Grant | **5,750,000** | Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported. | Risk – Medium<br><br>Baseline private sector projects are not forthcoming.<br><br>The visibility for investments in the construction sector is very short-term, especially for the residential sector. Since the project is not expected to start until the end of 2017 or beginning 2018, there is a moderate risk that the 2 baseline project may not materialize. | The PMU, supported by UNDP will maintain a close working relationship with the Jordan Housing Developers Association (JHDA) in order to ensure that, if needed, alternative new residential building developments are identified at the inception stage of the project. |
| Private Sector | In-kind | **150,000** | → Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy | Same as above. | Same as above. |

| Co-financing source | Co-financing type | Co-financing amount | Planned Outputs | Risks | Risk Mitigation Measures |
|---|---|---|---|---|---|
| | | | Codes.<br>→ Output 2.5: At least 5 ESCOs accredited and capacitated via programme.<br>→ Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported. | | |
| UNDP | Cash | **100,000** | → Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.<br>→ Output 1.2: Quantification of all energy, water and material flows in the GAM.<br>→ Output 2.1: A new SDD set-up within GAM.<br>→ Output 2.4: Development of a training and accreditation programme for ESCOs for selected Building Energy Codes.<br>→ Output 2.5: At least 5 ESCOs accredited and capacitated via programme.<br>→ Output 2.6: Development and dissemination of an online tool for carrying out comparative socio-economic and environmental analysis of buildings using life-cycle methodology. | Risk – Low<br><br>This budget has already been earmarked for the project using UNDP TRAC funding. | none |
| UNDP | In-kind | **150,000** | → All project outputs through financial management, procurements, and M&E | Risk – Low<br><br>The in-kind contribution of the UNDP acting as the GEF Agency is assured in the project through its involvement in the PSC, financial management, procurement services, and M&E. | none |

158. Budget Revision and Tolerance. As per the UNDP requirements outlined in the UNDP POPP, the Project Steering Committee can agree on a budget tolerance level for each plan under the overall annual work plan, allowing the project manager to expend up to the tolerance level beyond the approved project budget amount for the year without requiring a revision from the PSC. Should the following deviations occur, the Project Manager and UNDP Country Office will seek the approval of the UNDP-GEF team as these are considered major amendments by the GEF: a) budget re-allocations among components in the project with

amounts involving 10% of the total project grant or more; b) introduction of new budget items/or components that exceed 5% of original GEF allocation. Any over expenditure incurred beyond the available GEF grant amount will be absorbed by non-GEF resources (e.g. UNDP TRAC or cash co-financing).

159. Refund to Donor: Should a refund of unspent funds to the GEF be necessary, this will be managed directly by the UNDP-GEF Unit in New York.

160. Project Closure. Project closure will be conducted as per the UNDP requirements outlined in the UNDP POPP (see https://info.undp.org/global/popp/ppm/Pages/Closing-a-Project.aspx). On an exceptional basis only, a no-cost extension beyond the initial duration of the project will be sought from in-country UNDP colleagues and then the UNDP-GEF Executive Coordinator.

161. Operational completion: The project will be operationally completed when the last UNDP-financed inputs have been provided and the related activities have been completed including the final clearance of the Terminal Evaluation Report that must be available in English, and after the final Project Steering Committee meeting. The Implementing Partner, through a Project Steering Committee decision, will notify the UNDP Country Office when the operational closure has been completed. The relevant parties will then agree on the disposal of any equipment that is still the property of UNDP.

162. Financial completion: The project will be financially closed when the following conditions have been met: a) the project is operationally completed or has been cancelled; b) the implementing partner has reported all financial transactions to UNDP; c) UNDP has closed the accounts for the project; and d) UNDP and the implementing partner have certified a final Combined Delivery Report (which serves as final budget revision).

163. The project will be financially completed within 12 months of operational closure or after the date of cancellation. Between operational and financial closure, the implementing partner will identify and settle all financial obligations and prepare a final expenditure report. The UNDP Country Office will send the final signed closure documents, including confirmation of final cumulative expenditure and unspent balance, to the UNDP-GEF Unit for confirmation before the project is financially closed in Atlas by the Country Office.

164. Refund to GEF: Should a refund of unspent funds to the GEF be necessary, this will be managed directly by the UNDP-GEF Unit in New York.

165. UNDP Direct Project Services as requested by Government: UNDP will maintain the oversight and management of the overall project budget. It will be responsible for monitoring project implementation, timely reporting of the progress to the UNDP Regional Service Centre in Istanbul and the GEF, as well as organising mandatory and possible complementary reviews, financial audits and evaluations on an as-needed basis. It will also support the implementing partner in the procurement of the required expert services and other project inputs and administer the required contracts. Furthermore, it will support the coordination and networking with other related initiatives and institutions in the country.
The Hashemite Kingdom of Jordan may request UNDP direct services for specific projects, according to its policies and convenience. The UNDP and Hashemite Kingdom of Jordan acknowledge and agree that those services are not mandatory, and will be provided only upon Government request. If requested the services would follow the UNDP policies on the recovery of direct costs. These services (and their costs) are specified in the Letter of Agreement (Annex I). As is determined by the GEF Council requirements, these service costs will be assigned as Project Management Cost, duly identified in the project budget as Direct Project Costs. Eligible Direct Project Costs should not be charged as a flat percentage. They should be calculated on the basis of estimated actual or transaction based costs and should be charged to the direct project costs account codes: “64397- Direct Project Costs – Staff” and “74596-Direct Project Costs – General Operating Expenses (GOE)”.

## 9. TOTAL BUDGET AND WORK PLAN

| Total Budget and Work Plan | | | |
|---|---|---|---|
| Atlas Proposal or Award ID: | 00107209 | Atlas Primary Output Project ID: | 00107565 |
| Atlas Proposal or Award Title: | A systemic approach to sustainable urbanization and resource efficiency in Greater Amman Municipality (GAM) | | |
| Atlas Business Unit | JOR10 | | |
| Atlas Primary Output Project Title | A systemic approach to sustainable urbanization and resource efficiency in Greater Amman Municipality (GAM) | | |
| UNDP-GEF PIMS No. | 5543 | | |
| Implementing Partner | Greater Amman Municipality | | |

| GEF Outcome/Atlas Activity | Responsible Party/ Implementing Agent | Fund ID | Donor Name | Atlas Budgetary Account Code | ATLAS Budget Description | Amount Year 1 (US$) | Amount Year 2 (US$) | Amount Year 3 (US$) | Amount Year 4 (US$) | Amount Year 5 (US$) | Total (US$) | Budget Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OUTCOME 1: Planning and monitoring frameworks in place to foster accelerated low-carbon development in GAM and benchmark progress against established international standards | GAM | **62000** | **GEF** | 71200 | International Consultants | 12,000 | | 5,989 | | 6,146 | 24,135 | 1 |
| | | | | 71300 | Local Consultants | 29,800 | 22,000 | 1,000 | | | 52,800 | 2 |
| | | | | 71400 | Contractual Services - Individ | 13,448 | 13,448 | 13,448 | 13,448 | 13,448 | 67,240 | 3 |
| | | | | 72200 | Equipment and Furniture | 5,500 | | | | | 5,500 | 4 |
| | | | | 72500 | Office supplies | 2,000 | | | | | 2,000 | 5 |
| | | | | 71600 | Travel | 2,996 | | 1,714 | | 1,915 | 6,625 | 6 |
| | | | | 74200 | Audio Visual&Print Prod Costs | 3,000 | 2,000 | | | | 5,000 | 7 |
| | | | | 75700 | Workshops and Meetings | 9,500 | 31,000 | 23,000 | 18,200 | | 81,700 | 8 |
| | | | | 74100 | Professional Services (Audit) | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 5,000 | 9 |
| | | | | | **sub-total GEF** | **79,244** | **69,448** | **46,151** | **32,648** | **22,509** | **250,000** | |
| | **GAM** | **4000** | **UNDP** | 71600 | Travel | 11,100 | 11,100 | 11,100 | 11,100 | | 44,400 | 10 |
| | | | | | **sub-total UNDP** | **11,100** | **11,100** | **11,100** | **11,100** | | **44,400** | |
| | | | | | **sub-total outcome 1** | **90,344** | **80,548** | **57,251** | **43,748** | **22,509** | **294,400** | |
| OUTCOME 2: The enabling conditions, | GAM | **62000** | **GEF** | 71200 | International Consultants | | 52,000 | 43,680 | | 6,240 | 101,920 | 11 |
| | | | | 71300 | Local Consultants | 9,200 | 40,800 | 44,400 | 6,800 | 4,800 | 106,000 | 12 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| methodologies and tools in GAM for enforcing regulatory frameworks for EE buildings and street lighting strengthened | | | | 71400 | Contractual Services - Individ | 20,672 | 20,672 | 20,672 | 20,672 | 20,672 | 103,360 | 13 |
| | | | | 72200 | Equipment and Furniture | 1,500 | | | | | 1,500 | 14 |
| | | | | 71600 | Travel | 1,000 | 15,150 | 9,075 | | 1,944 | 27,169 | 15 |
| | | | | 72500 | Office supplies | 1,200 | 1,846 | 900 | | | 3,946 | 16 |
| | | | | 74200 | Audio Visual&Print Prod Costs | 1,400 | 3,300 | 3,505 | 200 | 200 | 8,605 | 17 |
| | | | | 75700 | Workshops and Meetings | 8,500 | 10,000 | 15,000 | 4,500 | 4,500 | 42,500 | 18 |
| | | | | 74100 | Professional Services (Audit) | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 5,000 | 9 |
| | | | | | **sub-total GEF** | **44,472** | **144,768** | **138,232** | **33,172** | **39,356** | **400,000** | |
| | GAM | **4000** | **UNDP** | 71200 | International Consultants | | 8,800 | | | | 8,800 | 19 |
| | | | | 71300 | Local Consultants | | 7,200 | 5,200 | 2,000 | | 14,400 | 20 |
| | | | | 72500 | Office supplies | | 2,500 | 2,500 | 1,500 | 1,500 | 8,000 | 21 |
| | | | | 71600 | Travel | | 2,775 | | | | 2,775 | 22 |
| | | | | 72200 | Equipment and Furniture | 4,000 | | | | | 4,000 | 23 |
| | | | | 74200 | Audio Visual&Print Prod Costs | | 2,800 | 4,325 | 1,500 | 1,500 | 10,125 | 24 |
| | | | | 75700 | Workshops and Meetings | | 1,000 | 2,500 | 2,500 | 1,500 | 7,500 | 25 |
| | | | | | **sub-total UNDP** | **4,000** | **25,075** | **14,525** | **7,500** | **4,500** | **55,600** | |
| | | | | | **sub-total outcome 2** | **48,472** | **169,843** | **152,757** | **40,672** | **43,856** | **455,600** | |
| OUTCOME 3: An integrated climate monitoring and finance framework is established for the development of urban NAMAs.<br><br>Appropriate financial de-risking tools are identified and supported to promote adoption of EE measures in buildings attached to MRV systems. | GAM | **62000** | **GEF** | 71200 | International Consultants | 20,000 | 55,200 | 34,720 | 28,000 | 30,160 | 168,080 | 26 |
| | | | | 71300 | Local Consultants | 18,000 | 26,400 | 14,800 | 14,000 | 6,000 | 79,200 | 27 |
| | | | | 71400 | Contractual Services - Individ | 26,048 | 26,048 | 26,048 | 26,048 | 26,048 | 130,240 | 28 |
| | | | | 72500 | Office supplies | | | 794 | 200 | 500 | 1,494 | 29 |
| | | | | 71600 | Travel | 6,825 | 10,875 | 9,180 | 11,220 | 9,486 | 47,586 | 30 |
| | | | | 74200 | Audio Visual&Print Prod Costs | | 500 | 13,400 | 500 | 11,000 | 25,400 | 31 |
| | | | | 75700 | Workshops and Meetings | 1,500 | 7,500 | 8,000 | 8,000 | 8,000 | 33,000 | 32 |
| | | | | 74100 | Professional Services(Audit) | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 5,000 | 9 |
| | | | | | **sub-total GEF** | **73,373** | **127,523** | **107,942** | **88,968** | **92,194** | **490,000** | |
| | | | | | **sub-total outcome 3** | **73,373** | **127,523** | **107,942** | **88,968** | **92,194** | **490,000** | |
| OUTCOME 4: Selected | GAM | **62000** | **GEF** | 71200 | International Consultants | 16,000 | 4,000 | | | | 20,000 | 33 |

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| proof-of-concept mitigation interventions. | | | | 71300 | Local Consultants | 28,775 | 14,400 | | | | 43,175 | 34 |
| | | | | 75700 | Workshops and Meetings | 1,000 | 2,500 | | | | 3,500 | 35 |
| | | | | 71600 | Travel | 6,775 | 0 | | | | 6,775 | 36 |
| | | | | 72200 | Equipment and Furniture | 81,902 | 561,175 | 442,442 | 215,531 | | 1,301,050 | 37 |
| | | | | | **sub-total GEF** | **134,452** | **582,075** | **442,442** | **215,531** | **0** | **1,374,500** | |
| | | | | | **sub-total outcome 4** | **134,452** | **582,075** | **442,442** | **215,531** | **0** | **1,374,500** | |
| PROJECT MANAGEMENT UNIT | GAM | **62000** | **GEF** | 71400 | Contractual Services - Individ | 12,072 | 12,072 | 12,072 | 12,072 | 12,072 | 60,360 | 38 |
| | | | | 71200 | International Consultants | | | 9,211 | | 9,454 | 18,665 | 39 |
| | | | | 75700 | Workshops and Meetings | 5,000 | | | | | 5,000 | 40 |
| | | | | 71600 | Travel | | | 2,636 | | 2,945 | 5,581 | 41 |
| | | | | 74596 | Direct Project Costs | 7,179 | 7,179 | 7,179 | 7,179 | 7,178 | 35,894 | 42 |
| | | | | | **Total Management GEF** | **24,251** | **19,251** | **31,098** | **19,251** | **31,649** | **125,500** | |
| | | | | **PROJECT TOTAL (GEF)** | | **355,792** | **943,065** | **765,865** | **389,570** | **185,708** | **2,640,000** | |
| | | | | **PROJECT TOTAL (UNDP)** | | **15,100** | **36,175** | **25,625** | **18,600** | **4,500** | **100,000** | |
| | | | | **PROJECT TOTAL (GEF + UNDP)** | | **370,892** | **979,240** | **791,490** | **408,170** | **190,208** | **2,740,000** | |

**Budget notes:**

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|---|---|
| **OUTCOME 1** | |
| 1 | An international consultant is recruited in Yr 1 (US$12,000) for reviewing and developing a Data Management System (DMS), including data quality assurance, to support energy, water and materials inventories at the Urban Observatory, GAM. The budgets for Yr 3 (US$5,989) and Yr5 (US$6,146) are the consultancy fees for carrying out project mid-term review and terminal evaluation, respectively. About twenty per cent (19.7% to be precise) of the international consultancy fees for project M&E is allocated to Outcome 1 under Output 1.4. |
| 2 | The strategy is to employ predominantly national consultants for the development of the GAM Sustainability Plan and Financing Strategy, and for enhancing the data management system and inventory. In Yr 1 and Yr 2, the total consultancy budget is US$39,000 for Output 1.1, and it is US$6,800 for Output 1.3. The strategy to adopt national consultants is substantiated by the fact that all technical support for the implementation of the Urban Sustainability Framework (USF) and associated tools and methodologies will be provided by the GPSC. Trainings of selected national counterparts will be covered through UNDP co-financing as discussed at 9 below. The remaining US$7,000 is for carrying out Output 1.4. |
| 3 | Outcome 1 covers 19% of the salary of the PM (i.e. US$10,252 / yr) and ~17% of Administrative Assistant salary (i.e. US$3,196 / yr). The costs are allocated to Output 1.2. |
| 4 | The budget is as follows: (1) 2 computers each costing US$1,500 for the PM and Administrative Assistance (i.e. US$3,000); (2) 1 printer worth US$1,000 for the PMU; and (2) 1 computer for the GAM Urban Observatory. |
| 5 | Office supplies worth US$2,000 are allocated to initiate the work of the PMU. |
| 6 | The travel budget is related to the travel costs for international consultants described at 1 above. For consultants carrying out project M&E, only 19.7% of total travel costs are covered under Output 1.4. |
| 7 | A total of US$4,000 is earmarked for Output 1.1 (US$2000 in each of Yr 1 and Yr2). Half of the budget is allocated to developing the Sustainability Plan and the other half for the formulation of the Financing Strategy. The remaining printing costs are for implementing Output 1.3. |
| 8 | Workshops constitute a relatively large budget item, and it is related to the development of the GAM Sustainability Plan and Financing Strategy. The USF uses an extensive multi-stakeholder engagement approach to coordinate the development of the Sustainability Plan across all city stakeholders, including representatives of citizens. Sixteen (16) mini-workshops are planned in Yr 1 (10 events – US$5,000) and Yr 2 (6 events – US$3,000) for Output 1.1. Regarding Out 1.3, one national workshop is planned in Yr 1 to deliver training to staff of the Amman Urban Observatory on the tools and methodologies adopted from the global Sustainable Cities IAP. A total of 8 coordination workshops are planned over Yr1 and Yr2 for Institutional coordination enhancements in order for better GAM linkages with national institutions that provide primary data. |
| 9 | The project budget includes an annual audit cost US$ 1,000 as per M&E requirements and budget detailed in TABLE 17. Please note that this is repeated under Outcome 2 and Outcome 3. |
| 10 | UNDP will finance the participation of 4 selected persons to attend the annual meeting of the GPSC (2 persons/year) related to Output 1.1 and to participate in the trainings (2 persons/year) delivered by the GPSC on tools and methodologies developed under the Sustainable Cities IAP (Output 1.2) in Yrs 1 -4. The cost per person per year is US$ 2,775. |
| **OUTCOME 2** | |
| 11 | The budget for international consultants cover the following: (1) 20% of the consultancy fees for carrying out the mid-term review (Yr3 – US$6,080) and terminal evaluation (Yr5 – US$6,240); (2) development of retrofit guidelines under Output 2.3 (Yr2 – US$6,400; Yr3 – US$6,400); (3) development of an accreditation scheme for ESCOs under Output 2.4 (Yr2 – US$8,000); (4) development of an online tool for carrying out comparative socio-economic and environmental analysis of EE in buildings under Output 2.6 (Yr2 – US$9,600; Yr3 – 5,600); (5) developing building energy performance standard and labeling under Output 2.7 (Yr2 – US$28,000; Yr3 – US$25,600). |
| 12 | National consultants will be used to support the work that will be carried out by the international consultants as per 10 above. The learning-by-doing approach to capacity building is also related to the transfer of technical capacity to national consultants, in addition to institutional stakeholders. The implementation of Outputs 2.1 (Yr1 – US$4,400) and 2.2 (Yr2 – US$7,600; Yr3 – US$2,800) make exclusive use of national consultants since the relevant capacity already exists in Jordan. For Output 2.3, the allocation is as follows: Yr1 – US$4,800; Yr2 – US$6,400; Yr3 – US$7,200; For Output 2.4, the allocation is: Yr2 – US$5,200; Yr3 – US$6,000; For Output 2.5, the allocation is: Yr2 – US$2,000; Yr3 – US$4,400; Yr4 – US$2,400; Yr5 – US$2,400; For Output 2.6, the allocation is: Yr2 – US$10,000; Yr3 – US$12,400; Yr4 – US$2,400; Yr5 – US$2,400; For Output 2.7, the allocation is: Yr2 – US$9,600; Yr3 – US$11,600; Yr4 – US$2,000. |
| 13 | Outcome 2 covers 31.3% of the salary of the PM (i.e. US$15,628/ yr) and 27.3% Administrative Assistant salary (i.e. US$5,044 / yr). The costs are allocated to Output 2.4 and Output 2.5, respectively. |
| 14 | One computer worth US$1,500 will be provided to the SDD that will be set up in GAM. |
| 15 | All the travels (cost of airfare and per diem) are related to the international missions discussed at 10 above, including: (1) 20% of the travels costs related to carrying out the mid-term review (Yr3 – US$1,740) and terminal evaluation (Yr5 – US$1,944); (2) development of retrofit guidelines under Output 2.3 (Yr2 – US$2,775; Yr3 – US$2,265); (3) development of an |

| | |
|---|---|
| | accreditation scheme for ESCOs under Output 2.4 (Yr2 – US$2,775 and Yr3 – US$2,000 – the mission straddles Yr2 and Yr3); (4) development of an online tool for carrying out comparative socio-economic and environmental analysis of EE in buildings under Output 2.6 (Yr2 – US$2,775; Yr3 – international consultant is home-based and in-country support is provided by national consultant); (5) developing building energy performance standard and labeling under Output 2.7 (Yr2 – US$6,825; Yr3 – US$11,600). |
| 16 | This is a minor budget expenditure that will support the implementation of all the outputs of Outcome 2. In each of Yr1 and Yr2, US$1,000 will be provided to the newly established SDD. The remaining funding will be for the PMU. |
| 17 | The printing costs of US$1,400 in Yr1 will be used for publicizing the setting up of the SDD under Output 2.1 (US$1,000), and US$400 is budgeted for initiating the revision of Building Energy Codes under Output 2.3. Output 2.2 that covers the training of engineers and inspectors at GAM on Building Energy Codes is allocated US$1,200 (Yr2) and YS$500 (Yr3); Updating the existing Building Energy Codes under Output 2.3 in Yr2 and Yr3 are allocated a printing budget of US$400 / yr; the development of training programmes on Building Energy Codes is allocated a budget of US$800 in each of Yr2 and Yr3; the training provided to ESCOs on Building Energy Codes under Output 2.5 is allocated a budget of US$400 for each of Yr2 and Yr3. |
| 18 | Workshops are the primary means for carrying out trainings and meetings the primary means for coordinating national stakeholders. For Output 2.1, a total of 2 national workshops (total of US$5,000) and 3 mini-workshops (US$1,500) are budgeted in Yr1. Three (3) mini-workshops will also be carried out related to updating Building Energy Codes under Output 2.3; A national workshop will be carried out in each of Yr2 and Yr3 for communicating and disseminating the updated Building Energy Codes (i.e. total of US$5,000); engineers and inspectors will be trained on Building Energy Codes in four batches over Yr2 and Yr3 – 2 mini-workshops per year or US$1,000 per year; implementation of Output 2.4 (i.e. development of training programmes on Building Energy Codes) will require 4 mini-workshops in each of Yr2 and Yr3 (i.e. US$2,000/yr); Regarding Output 2.5, ESCOs will be trained in 2batches in each of Yr2 and Yr3 (i.e. US$1,000/year); for developing the online tool under Output 2.6, a national workshop will be held in Yr2 (US$2,500) and 3 mini-workshops in Yr3 (US$1,500). Further, 3 mini-workshops will be organized in each of Yr3, Yr4 and Yr5 to disseminate the tool (US$1,500/yr). Finally, national institutions will be trained on the maintenance of and updating the tool through 2 mini-workshops in each of the last 3 years of the project (i.e. US$1,000/yr). |
| 19 | UNDP will fund the recruitment of an international consultant for developing a training course for ESCOs to respond to Request for Proposals of energy efficiency services by public and private building developers. The international consultant will also train the local consultant in delivering the first course to ESCOs as part of the learning-by-doing capacity building approach used by the project. For this, 11 days of services have been budgeted. |
| 20 | Local consultants are mainly used to deliver trainings to ESCOs to capacitate then to respond to Request for Proposals of EE services. The local consultants will initially (Yr 2) be trained by the international consultant (see 18 above). It is expected that 2 training sessions each of 3 to 4 days will be delivered per year in Yrs 2, 3 and 4. The cost related to Output 2.5 is US$8,000. The remaining local consultant budget is dedicated to Output 2.4 for the development of accredited training courses on Building Energy Codes. |
| 21 | The office supplies are needed to support the administration of the SDD (see 22 below) that will be set up in GAM and to support the trainings of ESCOs as explained in 19 above. The SDD will receive US$ 1,500 per year between Yr 2 and Yr5. The delivery of trainings under Output 2.4 will receive US$1,000 per year in each of Yr 2 and Yr3. |
| 22 | This budget is for the international travel of the consultant (see 18 above) who will be recruited to develop a training course for ESCOs to respond to Request for Proposals of energy efficiency services by public and private building developers. One in-country mission of 5 days is planned (one airfare of US1,500; and per diem of US$255 per day). |
| 23 | The SDD that will be set up in GAM will receive 2 computers (US$ 1,500 per computer) and one printer (US$ 1,000) totaling US$4,000 in Yr1. |
| 24 | All printing costs are related to the design and delivery of training courses to ESCOs under Output 2.4 (US$ 5,625). An annual budget of US$ 1,500 has been allocated for each of Yrs 3 – 5 for dissemination the tool that will be developed under Output 2.6 for carrying out comparative socio-economic and environmental analysis of building envelope thermal insulation and other EE measures related to buildings. |
| 25 | Two mini workshops (US$ 500 per workshop) will be carried out each year in Yrs 2, 3 and 4 for training of ESCOs on how to respond to Request for Proposals of EE services (see 19 above). In order to disseminate the tool 6 for carrying out comparative socio-economic and environmental analysis of building envelope thermal insulation and other EE measures related to buildings, and explain its functionalities, three mini-workshops (total of US$1,500) are targeted each year between Yr 3 and Yr 5. |
| **OUTCOME 3** | |
| 26 | The international consultancy fees is partitioned as follows: (1) 30% of the fees for carrying each of the mid-term review (Yr3 – US$9,120) and terminal evaluation (Yr5 – US$9,360); (2) developing standardized baselines and MRV system under Output 3.1 (Yr1 – US$16,000; Yr2 – US$19,200); (3) development of an urban NAMA under Output 3.2 (Yr4 – US$24,000); (4) carrying out micro- and macro-economic analysis of selected de-risking instruments (Output 3.4) and supporting development of business models for implementing selected public de-risking instruments under Output 3.3 (Yr2 – US$12,800; Yr3 – US$25,600; Yr4 – US$4,000; Yr5 – US$4,800); (5) carrying out detailed DEEI analysis for promoting investments in Building Energy Codes under Output 3.4 (Yr1 – US$4,000; Yr2 – US$23,200; Yr3 – US$9,120; Yr5 – US$9,360); (6) completing study to compile lessons learned, and best practices developed by the project under Output 3.5 (Yr5 – US$16,000). |
| 27 | National consultants are used to support the work carried out by the international consultants as described at 25 above. The budget allocation are as follows: (1) Output 3.1: Yr1 – |

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|---|---|
| | US$10,000; Yr2 – US$8,800; (2) Output 3.2: Yr4 – US$10,000; (3) Output 3.3: Yr2 – US$8,000; Yr3 – US$12,000; Yr4 – US$2,000; Yr5 – US$4,000; (4) Output 3.4: Yr1 – US$1,200; Yr2 – US$7,600; Yr3 – US$800; (5) Output 3.5: Yr1: US$6,800; Yr2 – US$2,000; Yr3 – US$2,000; Yr4 – US$2,000; Yr5 – US$2,000. |
| 28 | Outcome 3 covers 39.1% of the salary of the PM (i.e. US$21,504/ yr) and 27.3% of the Administrative Assistant salary (i.e. US$5,544 / yr). The costs are allocated to Output 3.4 and Output 3.5, respectively. |
| 29 | The small budget for office supplies is for the PMU. The allocation is for Output 3.3 in Yr2 and Yr3, and it is against Output 3.2 in Yr5. |
| 30 | The travel costs are mainly associated with the missions of international consultants as follows: (1) 30% of total travel costs for carrying out mid-term review (Yr3 - US$2,610) and terminal evaluation (Yr5 – US$2,916); (2) developing standardized baselines and MRV system under Output 3.1 (Yr1 – US$4,050; Yr2 – US$2,775); (3) development of an urban NAMA under Output 3.2 (Yr4 – US$8,955); (4) carrying out micro- and macro-economic analysis of selected de-risking instruments (Output 3.4) and supporting development of business models for implementing selected public derisking instruments under Output 3.3 (Yr2 – US$4,050; Yr3 – US$4,050; Yr4 – US$2,265); (5) carrying out detailed DEEI analysis for promoting investments in Building Energy Codes under Output 3.4 (Yr1 – US$2,775; Yr2 – US$4,050; Yr3 – US$5,130; Yr5 – US$2,916). It is also planned that the results of lessons learned, and best practices that will be developed under Output 3.5 will be presented at an international conference (Yr5 – US$2,520). |
| 31 | The budget in Yr2 is for printing the standardized baselines developed under Output 3.1. In Yr3, US$11,900 is dedicated to printing the Jordan DEEI results in high quality printed report for worldwide dissemination. The remaining budget is for Output 3.3. In Yr5, a budget of US$11,000 has been earmarked for the publication of the lessons learned report that will be developed under Output 3.5. |
| 32 | In Yr1, 2 mini-workshops will be organised for developing standardized baselines (Output 3.1), and 1 mini-workshop will be needed for validating the risk table for DEEI analysis (Output 3.4); In Yr2, 1 national workshop will be organised for validating and disseminating the standardized baselines; 3 mini-workshops will be carried out to assess the socio-economic impacts of derisking instrument package that will be developed under Output 3.4; and 2 mini and 1 national workshop will be organised related to DEEI analysis; In Yr3, a national workshop will be organised to disseminate the results of DEEI analysis; another such workshop will be organised to disseminate the results of socio-economic impacts of the package of public instruments; another 3 mini-workshops will be organised to support work to be carried out for Output 3.3 and Output 3.4; In Yr4, a national workshop will be organised to share the business models that will be developed for JREEEF financial instruments for promoting EE in buildings, and a national workshop will be organised for communicating the finalised standardized baselines and MRV system; In Yr 5, 4 mini-workshops will be needed to inform the lessons learned study, and a national workshop will be organised to share the results of the study with all stakeholders; 3 mini-workshops are budgeted for providing technical support to JREEEF for implementing the selected derisking instruments; 4 mini-workshops are budgeted for developing a replicating plan for urban NAMA in other cities in Jordan, and for engaging development partners to finance the GAM urban NAMA. |
| **OUTCOME 4** | |
| 33 | International consultants are used exclusively for completing the activities related to Output 4.3, namely for developing a EE Lighting Code (Yr1 – US$8,000; Yr2 – US$4,000) and technical analysis for the choice of smart lighting usage system (Yr1 – US$8,000). |
| 34 | National consultants are used to support the work of the international consultants at 33 above. These consultants will be used for three main activities: (1) developing technical design to retrofit existing buildings; (2) developing EE Lighting Code; and (3) developing technical design for PV lighting. The budget allocation for technical design of existing buildings is: Yr1 – US$14,000; Yr2 – US$10,000. The budget allocation for developing a EE Lighting Code is: Yr1 – US$4,000; Yr2 – US$2,000, and for technical analysis for the choice of smart lighting usage system it is: Yr1 – US$2,775. For PV street lighting the allocation is: Yr1 – US$8,000. Finally, a sum of US$2,400 is allocated in Yr2 for activity 4.2.2 (tendering process for contracting out retrofits in existing buildings. |
| 35 | Two mini-workshops (US$1,000) are planned in Yr1 for stakeholder coordination during the development of the EE Lighting Code, and one national workshop for disseminating the Code in Yr2 (US$2,500). |
| 36 | This budget is for covering the travel cost of international consultants used for completing the activities related to Output 4.3, namely for developing a EE Lighting Code (Yr1 – US$2,775; Yr2 – US$2,000) and technical analysis for the choice of smart lighting usage system (Yr1 – US$4,000). |
| 37 | The bulk of the budget for Outcome 4 is dedicated to investments in envelope insulation of new (Output 4.1) and existing buildings (Output 4.2), and the installation of 570 units of solar PV street or open lighting (Output 4.4). For new buildings (as detailed in Section 3.1.4 above), the investments are scheduled as follows: Yr1 – US$81,902; Yr2 – US$193,978; Yr3 – US$64,659. For buildings that will be retrofitted, the investment schedule is as follows: Yr2 – US$46,210; Yr3 – US$301,743; Yr4 – US$189,667. All of the procurement budget for standalone PV lighting is carried out in Yr2 for US$164,900.<br><br>Investments are also earmarked for implementing water efficient fixtures in buildings as follows: Yr2 – US$35,000; Yr3 – US$20,000. |

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| | Investments in smart lighting devices will be as follows: Yr2 – US$121,087; Yr3 – US$56,040; Yr4 – US$25,864. |
| **PROJECT MANAGEMENT COST (PMC)** | |
| 38 | Includes remaining salary of the Project Manager (US$ 6,876 per year) and of the Administrative Assistant (US$ 5,696 per year). The profiles and well as salaries are given in the terms of references in Annex E. |
| 39 | This budget line is for covering 30% of the international consultancy fees for carrying out the mid-term review (US$ 9,211) and terminal evaluation (US$9,454) as per M&E requirements and budget detailed in TABLE 17. 70% of the total cost of M&E has been spread out under the project activities. |
| 40 | US$ 5,000 has been earmarked for organizing the Inception Workshop as per M&E requirements and budget detailed in TABLE 17. |
| 41 | The budget is for covering 30% of the travel costs (international airfare and field visits in GAM) associated with the mid-term review (US$ 2,636 ) and the terminal evaluation (US$ 2,945). |
| 42 | Direct project costs totaling US$ 35,894 have been included in the project management costs. The calculation of the total direct project cost is given in Annex SA8, which also contains the LOA between the Hashemite Kingdom of Jordan and the UNDP. |

**Breakdown of GEF and UNDP funds**

| Items | GEF (US$) | UNDP (US$) |
|---|---|---|
| DPC | 35,894 | |
| Audit | 15,000 | |
| International consultants | 332,800 | 8,800 |
| National consultants | 281,175 | 14,400 |
| Travel | 93,736 | 47,175 |
| Printing & publication | 39,005 | 10125 |
| Equipment | 1,308,050 | 4,000 |
| Workshop | 165,700 | 7,500 |
| Contractual services individual | 361,200 | |
| Office supplies | 7,440 | 8,000 |
| TOTAL | **2,640,000** | **100,000** |

**Summary of Funds:**[69]

| | Amount Year 1 (US$) | Amount Year 2 (US$) | Amount Year 3 (US$) | Amount Year 4 (US$) | Amount Year 5 (US$) | Total (US$) |
|---|---|---|---|---|---|---|
| GEF | 355,792 | 943,065 | 765,865 | 389,570 | 185,708 | **2,640,000** |
| UNDP (TRAC) | 15,100 | 36,175 | 25,625 | 18,600 | 4,500 | **100,000** |
| UNDP (in-kind) | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | **150,000** |

[69] Summary table should include all financing of all kinds: GEF financing, co-financing, cash, in-kind, etc.

| | | | | | | |
|---|---|---|---|---|---|---|
| Recipient Government/Ministry of Environment (cash) | 240,000 | 200,000 | 200,000 | 80,000 | 80,000 | **800,000** |
| Recipient Government/Ministry of Environment (in-kind) | 60,000 | 50,000 | 50,000 | 20,000 | 20,000 | **200,000** |
| Recipient Government/MOPIC (in-kind) | 300,000 | 300,000 | 600,000 | 900,000 | 900,000 | **3,000,000** |
| Recipient Government/GAM (cash) | 1,350,000 | 1,800,000 | 3,600,000 | 1,800,000 | 450,000 | **9,000,000** |
| Recipient Government/GAM (in-kind) | 427,500 | 570,000 | 1,140,000 | 570,000 | 142,500 | **2,850,000** |
| NGO/WEEC (in-kind) | 0 | 15,000 | 0 | 0 | 0 | **15,000** |
| Private Sector/Hussein Maaitah & Partner Co Ltd (cash) | 275,000 | 1,375,000 | 825,000 | 275,000 | 0 | **2,750,000** |
| Private Sector/Al Tarek Co Ltd (cash) | 300,000 | 1,500,000 | 900,000 | 300,000 | | **3,000,000** |
| Beneficiary/Fadi Thaer Residential Building Committee (in-kind) | 15,000 | 45,000 | 45,000 | 30,000 | 15,000 | **150,000** |
| **TOTAL** | **3,368,392** | **6,864,240** | **8,181,490** | **4,413,170** | **1,827,708** | **24,655,000** |

## 10. LEGAL CONTEXT

166. This document, together with the CPAP signed by the Government and UNDP, which is incorporated by reference, constitute together a Project Document as referred to in the SBAA. All CPAP provisions apply to this document.

167. Consistent with Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

168. The implementing partner shall:
- Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried out;
- Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

169. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

170. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by the UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

## 11. MANDATORY AND SUPPLEMENTARY ANNEXES

- Annex A: Multi-year Workplan
- Annex B: Monitoring Plan
- Annex C: Evaluation Plan;
- Annex D: GEF Tracking Tool at baseline – *provided separately*
- Annex E: Terms of Reference for Project Board, Project Manager and other positions as appropriate – *provided separately*
- Annex F: UNDP Social and Environmental and Social Screening Template (SESP) – *provided separately*
- Annex G: Capacity Assessment of MUDH and HACT Micro Assessment – *provided separately*
- Annex H: Co-Financing Letters – *provided separately*
- Annex I: UNDP Direct Project Services Costs - LOA - *provided separately*

Additional information that are important regarding the design of the project, and which will be useful during project implementation and monitoring & evaluation are provided separately in the Supplementary Annexes that accompany this Project Document. The contents of the Supplementary Annexes are:

- Annex SA1: Energy and Emissions Context of Jordan
- Annex SA2: Policies, Strategies and Ongoing Initiatives to Encourage Energy Efficiency and Emission Reductions
- Annex SA3: Detailed Barriers Analysis and Derisking Energy Efficiency Investment (DEEI)
- Annex SA4: Theory of Change Diagram
- Annex SA5: GHG Emission Reduction Calculassions
- Annex SA6 : Gender Analysis
- Annex SA7 : Financial Analysis

## ANNEX A: MULTI YEAR WORK PLAN

MULTI-YEAR WORK PLAN 2017-21

Project title: A systemic approach to sustainable urbanization and resource efficiency in Greater Amman Municipality (GAM)
Project ID: 00107209

| EXPECTED OUTPUTS | PLANNED ACTIVITIES | PROJECT YEAR 20-- | | | | | RESPONSIBLE PARTY | PLANNED BUDGET | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 18 | 19 | 20 | 21 | 22 | | Funding Source | Budget Description | Amount (US$) |
| Outcome 1: Planning and monitoring frameworks in place to foster accelerated low-carbon development in GAM and benchmark progress against established international standards. | | | | | | | | | | |
| Output 1.1: Development of a Sustainability Plan (SP) and Financing Strategy (FS) for the GAM using the updated Amman Master Plan.<br><br>Indicator 1.1: Number of Sustainability Plan and Financing Strategy<br><br>Baselines (2017): No Sustainability Plan and Financing Strategy in place.<br><br>Targets (2018): 1 Sustainability Plan and 1 Financing Strategy developed and approved by GAM administration. | Activity 1.1.1: Review and update Greater Amman Metropolitan Growth Plan based on global framework and indicators. | x | | | | | GAM | GEF | 71300, 72200,72500 | 15000 |
| | Activity 1.1.2: Develop a Sustainability Plan (SP) for the period 2017 – 2030. | x | x | | | | GAM | GEF | 71300, 75700, 74200 | 20000 |
| | | x | x | x | x | | GAM | UNDP | 71600 | 22200 |
| | Activity 1.1.3: Develop a Financing Strategy (FS) to implement SP. | x | x | | | | GAM | GEF | 71300, 75700, 74200 | 20000 |
| | Activity 1.1.4: Carry out advocacy among national government, development partners, and civil society organizations to seek support (technical and financial) for the SP. | | x | x | | | GAM | GEF | 71300, 75700 | 5000 |
| Output 1.2: Quantification of all energy, water and material flows in the GAM.<br><br>Indicator 1.2: Number of tools and methodologies adopted from the global Sustainable Cities IAP.<br><br>Baselines (2017): There are no tools or methodologies that have been adopted from the global Sustainable Cities IAP. | Activity 1.2.1: Adopting tools and methodologies for energy, water and materials flow as developed by the global Sustainable Cities IAP. | x | x | | | | GAM | GEF | 71600,75700 | 3496 |
| | | x | x | x | x | | GAM | UNDP | 71600 | 22200 |
| | Activity 1.2.3: In conjunction with the activities under Output 1.3, carry out quantification of energy, water and waste flows for GAM to generate indicators relevant to ISO 37120. | x | x | x | x | x | GAM | GEF | 71400 | 53760 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Targets (2018): 3 tools/methodologies adopted for quantifying the flows of water, energy and waste in GAM. | Activity 1.2.4: Reporting of quantified indicators to the WCCD as part of ISO 37120. | x | x | | | | GAM | GEF | 71400 | 18480 |
| Output 1.3: Institutional strengthening of the Urban Planning Department and the Amman Urban Observatory for data analysis and reporting.<br><br>Indicator 1.3: Number of persons trained on the application of tools and methodologies; Number of enhancements to DMS; Number of MOUs signed.<br><br>Baselines (2017): No staff trained on the use of the global Sustainable Cities IAP tools and methodologies.<br><br>Targets (2018): 10 persons from GAM; at least one person from each key institution providing primary data on energy and water; and three trainers from an independent organization that can replicate the training are trained on the use of tools and methodologies. | Activity 1.3.1: Institutional coordination enhanced in order for better GAM linkages with national institutions that provide primary data (water and energy), including signature of Memorandum of Understandings (MOUs) for inter-institutional data sharing. | x | x | | | | GAM | GEF | 75700 | 4000 |
| | Activity 1.3.2: Training delivered to staff of the Urban Planning Department and the Amman Urban Observatory on the tools and methodologies adopted from the global Sustainable Cities IAP. National institutions provided primary data are also invited. | x | x | | | | GAM | GEF | 75700 | 4000 |
| | Activity 1.3.3: Data Management System (DMS), including data quality assurance, enhanced to support energy, water and materials inventory. | x | x | | | | GAM | GEF | 71200, 71300, 72200 74200 | 21300 |
| Output 1.4: Assessment and costing of awareness-raising campaigns for the Sustainability Plan.<br><br>Indicator 1.4: Number and cost of awareness campaigns.<br><br>Baselines (2017): There are no awareness campaigns.<br><br>Targets (2018 and 2020): 3 (2018) and 3 additional (2020) awareness raising campaigns implemented; | Activity 1.4.1: Awareness-raising campaign for promoting SP is developed (using results of Gender Analysis regarding energy and water efficiency, among others). | | x | | | | GAM | GEF | 71300, 75700 | 5000 |
| | Activity 1.4.2: Budget developed for awareness-raising campaign. | | x | | | | GAM | GEF | 71300 | 3000 |
| | Activity 1.4.3: Implementation of awareness-raising campaigns. | | x | x | x | | GAM | GEF | 75700 | 61200 |
| | Activity 1.4.4: Assessment of the effectiveness of the awareness-raising campaigns. | | | x | | x | GAM | GEF | 71200, 71600 | 15764 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL FOR COMPONENT 1 | | | | | | | | | | $294,400 |
| Outcome 2: The enabling conditions, methodologies and tools in GAM for enforcing regulatory frameworks for EE buildings and street lighting strengthened. | | | | | | | | | | |
| Output 2.1: A Sustainable Development Department (SDD) set-up within GAM.<br><br>Indicator 2.1: SDD is established according to approved Terms of Reference and position in organogram.<br><br>Baselines (2017): No SDD exists in GAM.<br><br>Targets (2021): 1 SDD is set up (staffed and provided with appropriate administrative and logistics support). | Activity 2.1.1: Terms of Reference of the SDD and its position in the GAM organogram are developed based on ground work carried out during project design. | x | | | | | GAM | GEF | 71300, 71600, 75700 | 7700 |
| | Activity 2.1.2: Approval received from the Greater Amman Municipal Council for the setting up of the SDD as per Terms of Reference and proposed organogram. | x | x | | | | GAM | GEF | 71300 | 1200 |
| | Activity 2.1.3: SDD is staffed with the necessary administrative and logistics support from GAM management. | | x | | | | GAM | GEF | 72200, 72500 | 2500 |
| | | x | x | x | x | x | GAM | UNDP | 72200, 72500 | 10000 |
| | Activity 2.1.4: National workshop for introducing and promoting the SDD to all divisions of GAM, as well as all relevant national and sub-national institutions. | | x | | | | GAM | GEF | 74200, 75700 | 3500 |
| Output 2.2: Enforcement capabilities of SDD strengthened as regards compliance with Building Energy Codes.<br><br>Indicator 2.2: Number of onsite inspections carried out by the SDD related to Building Energy Codes.<br><br>Baseline (2017): There is no SDD to carry out inspections.<br><br>Target (2019): 20 inspections carried out.<br>Target (2020): 50 inspections carried out.<br>Target (2021): 100 inspections carried out.<br>Target (2022): 200 inspections carried out. | Activity 2.2.1: 50 engineers and 50 inspectors associated with the SDD are trained on Building Energy Codes and on-site inspections of their applications. | | x | x | | | GAM | GEF | 71300, 72500, 74200, 75700 | 9700 |
| | Activity 2.2.2: Activity 2.2.2: Development of procedure manual for carrying out on-site inspections. | | x | | | | GAM | GEF | 71300, 72500, 74200 | 3400 |
| | Activity 2.2.3: On-site inspections of the application of Building Energy Codes, in collaboration with relevant stakeholders. This is linked to the activities under Outputs 4.1 and 4.2. | | x | | | | GAM | GEF | 71300 | 2000 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Output 2.3: Update of the existing Building Codes and development of a 'Retrofit Building Guidelines' to make upgrades more acceptable.<br><br>Indicator 2.3: Number of existing Building Energy Codes updated, and number of Retrofit Guidelines developed.<br><br>Baselines (2017): 2 Building Energy Codes are not up to date; no Retrofit Building Guidelines exist.<br><br>Targets (2021): 2 Building Energy Codes updated; at least 1 Retrofit Building Guidelines is developed with associated technical manual. | Activity 2.3.1: Existing Building Energy Codes are updated. | x | x | x | | | GAM | GEF | 71300, 72500, 74200, 75700 | 23700 |
| | Activity 2.3.2: Retrofit Building Guidelines developed for envelope insulation of existing buildings. | | x | x | | | GAM | GEF | 71200, 71600, 75700 | 20340 |
| | Activity 2.3.3: Technical manual developed for implementing Retrofit Building Guidelines, including benefit-cost analysis, available incentive schemes, and list of accredited Energy Service Providers (ESPs). | | x | x | | | GAM | GEF | 71300 | 4000 |
| Output 2.4 Development of a training and accreditation programme for ESCOs for selected Building Energy Codes.<br><br>Indicator 2.4.1: Number of training and accreditation programmes developed;<br>Indicator 2.4.2: Number of market outlets created;<br>Baseline (2017): There are no accreditation and training programmes for ESCOs.<br><br>Target (2018): Accreditation and training programmes developed for ESCOs;<br>Target (2021): At least 1 market outlet created for each ESCO; | Activity 2.4.1: Develop training programme for the Thermal Insulation Code, Energy Efficient Building Code and Mechanical Ventilation and AC Code, and accredited by the appropriate national qualifications authority (e.g. CESA). | | x | x | | | GAM | GEF | 71300, 72500, 74200, 75700 | 14000 |
| | | | x | x | | | GAM | UNDP | 71300, 72500, 74200 | 14025 |
| | Activity 2.4.2: Develop accreditation programme for ESCOs by building on the accreditation programme for ESPs established under the ESCB initiative. | | x | x | | | GAM | GEF | 71200, 71300, 71600 | 13975 |
| | Activity 2.4.3: Support the creation of market outlets for ESCOs (in conjunction with activities under Output 2.5) through linkages with public (e.g. JREEF and Ministry of Public Works) and private (Jordan Housing Developers Association) building developers. | | | x | x | x | GAM | GEF | 71400, 75700 | 86640 |
| Output 2.5 At least 5 ESCOs accredited and capacitated via programme.<br><br>Indicator 2.5: Number of ESCOs | Activity 2.5.1: Accreditation of ESCOs for Thermal Insulation Code, Energy Efficiency Building Code, and Mechanical Ventilation and AC Code through accreditation programme | x | | | | | GAM | GEF | 71400 | 27720 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| accredited and capacitated.<br><br>Baseline (2017): No accredited ESCOs.<br><br>Target (2019): 3 ESCOs accredited and capacitated;<br>Target (2021): At least 2 additional ESCOs accredited and capacitated; | developed under Activity 2.4.2. | | | | | | | | | |
| | Activity 2.5.2: ESCOs trained in programme developed under Activity 2.4.1. | x | x | | | | GAM | GEF | 71300, 72500, 74200, 75700 | 7200 |
| | Activity 2.5.3: ESCOs trained to respond to Request for Proposals of energy efficiency services by public and private building developers. | | x | x | x | x | GAM | GEF | 71300 | 7200 |
| | | | x | x | x | | GAM | UNDP | 71200, 71300, 71600, 75700 | 22575 |
| Output 2.6: Development and dissemination of an online tool for carrying out comparative socio-economic and environmental analysis of buildings using life-cycle methodology.<br><br>Indicator 2.6: Online tool is developed, and number of requests for downloading the online tool;<br><br>Baseline (2017): No online tool is widely accessible.<br><br>Targets (2019 and 2021): 1 online tool is widely accessible by 2019, and at least 200 requests for the tool are achieved by 2021. | Activity 2.6.1: Development of an online tool (e.g. Excel-based with user-friendly interface) for carrying out comparative socio-economic and environmental analysis of buildings using life-cycle methodology using preliminary tool developed by the JGBC as a starting point. | | x | x | | | GAM | GEF | 71200, 71300, 71600, 75700 | 42975 |
| | Activity 2.6.2: Making the tool widely accessible to all stakeholders (e.g. general public, building developers, professionals, students etc..) through multiple online platforms (e.g. websites of: project, GAM, professional institutions (e.g. JEA, architects .), public institutions (e.g. ministries, RSS .), universities, JGBC, JHDA, etc …). | | | x | x | x | GAM | GEF | 71200, 71600, 75700 | 20504 |
| | | | | x | x | x | GAM | UNDP | 74200, 75700 | 9000 |
| | Activity 2.6.3: Capacity transferred to selected organizations (e.g. JGBC and universities) to update and maintain the online tool. | | | x | x | x | GAM | UNDP | 71300, 74200, 75700 | 10800 |
| Output 2.7: Development of an energy rating and label for buildings for issuing Energy Performance Certificates.<br><br>Indicator 2.7: Labeling programme and standards developed. | Activity 2.7.1: Design, publish, communicate and implement labeling programme. | | x | x | | | GAM | GEF | 71200, 71300, 71600, 72500, 74200 | 46471 |
| | Activity 2.7.2: Analyze and set building energy performance standards. | | x | x | | | GAM | GEF | 71200, 71300, 71600 | 35250 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Baseline (2017): No building energy performance certification scheme based on a labeling and standards. | Activity 2.7.3: Develop and maintain a database or register to publish the energy performance ratings achieved by all buildings. | | | x | x | x | GAM | GEF | 71200, 71300, 71600, 74200 | 9225 |
| TOTAL FOR COMPONENT 2 | | | | | | | | | | $455,600 |
| Outcome 3: An integrated climate monitoring and finance framework is established for the development of urban NAMAs, and appropriate financial de-risking tools are identified and supported to promote adoption of EE measures in buildings attached to MRV systems. | | | | | | | | | | |
| Output 3.1: Development of an urban MRV system for (i) Building Energy Codes and (ii) energy efficient lighting for determination of emission reductions from investments.<br><br>Indicator 3.1.1: Number of established standardized baselines for calculating emission reductions. | Activity 3.1.1: Preparation of standardized baselines for: (1) grid emission factor for Jordan electricity system; (2) fuel consumption for space heating; and (3) electricity, and hence, carbon embodied in water used in buildings. The latter has 2 components related to the use of electricity for both space cooling/heating and street lighting. | x | x | | | | GAM, MEMR | GEF | 71200, 71300, 71600, 74200, 75700 | 43650 |
| Indicator 3.1.2: Urban MRV system developed and aligned with national MRV systems.<br><br>Baselines (2017): No established standardized baselines for calculating emission reductions; no urban MRV system<br><br>Targets (2018): 4 established standardized baselines, and 1 urban MRV system developed | Activity 3.1.2: Preparation of MRV system for Building Energy Codes based on baselines developed under Activity 3.1.1. | x | x | | | | GAM, MoE | GEF | 71200, 71300, 71600 | 21175 |
| Output 3.2: Development of 2 city-wide sectoral NAMAs, including investment plans for existing and new buildings, and street lighting. | Activity 3.2.1: Preparation of NAMA documentations and investment plans, and submitted to stakeholders for feedback. | | | | x | | GAM, MoE | GEF | 71200, 71300, 71600,75700 | 27050 |
| Indicator 3.2.1: Urban NAMA and investment plan | Activity 3.2.2: National workshop for finalizing NAMA submissions. | | | | x | | GAM, MoE | GEF | 75700 | 2500 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Indicator 3.2.1: Replication plan for other cities<br><br>Baselines (2017): No urban NAMAs developed for GAM; no replication plan in place<br><br>Targets (2020/2021): Two urban NAMAs developed for GAM (2020); 1 replication plan developed covering at least 2 cities/municipalities (2021). | Activity 3.2.3: Dialogues with bilateral and multilateral development partners for financing the urban NAMA. | | | | x | x | GAM, MOPIC | GEF | 75700 | 2000 |
| | Activity 3.2.4: Development of a replication plan for other cities in order to scale up emission reductions. | | | | x | x | GAM, MoE, MOPIC | GEF | 71200, 71300, 71600, 75700 | 20405 |
| Output 3.3: As part of NAMA development, assistance to the Jordan Renewable Energy and Energy Efficiency Fund to provide customised financial incentives to promote investments in Building Energy Codes, and in particular Thermal Insulation Code.<br><br>Indicator 3.3.1: Number of beneficiaries of financial incentives;<br>Indicator 3.3.2: Quantity of financial incentives disbursed (JOD)<br><br>Baselines (2017): No financial incentives provided by JREEEF to households for implementing Thermal Insulation Code.<br><br>Targets (2021): At least 25 building developers have received incentives to implement building thermal insulation; JOD 375,000 disbursed in the form of financial incentives.<br><br>To exact targets will be determined during the mid-term review. | Activity 3.3.1: Conduct a socio-economic study to demonstrate the micro- and macro-socioeconomic benefits of financial derisking instruments identified under Activity 3.4.2 to promote Building Energy Codes, and in particular the Thermal Insulation Code. | | x | x | | | GAM, MEMR, JREEEF | GEF | 71200, 71300, 71600, 72500, 74200, 75700 | 51650 |
| | Activity 3.3.2: Analyze and propose a business model, including means of capitalization, for adoption by JREEEF for the implementation of financial incentives (in the form of financial derisking instruments). | | | x | x | | GAM, JREEEF | GEF | 71200, 71300, 71600, 72500, 74200, 75700 | 34609 |
| | Activity 3.3.3: Technical support to JREEEF for the implementation of financial derisking instruments / financial incentives. | | | | | x | GAM, JREEEF | UNDP | 71200, 71300, 75700 | 10300 |
| Output 3.4: Identification and quantification of the effectiveness of different policy and financial de-risking instruments for EE buildings using | Activity 3.4.1: Validate the risks and corresponding derisking instruments presented in Annex SA3 accompanying the Project Document. | x | x | | | | GAM, UNDP | GEF | 71200, 71300, 71600, 75700 | 33681 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| UNDP's de-risking methodology (DEEI).<br><br>Indicator 3.4: Jordan DEEI report covering the quantification of effectiveness of derisking instruments.<br><br>Baselines (2017): No derisking instruments quantified for effectiveness (and no Jordan DEEI report).<br><br>Targets (2019): Quantification of effectiveness of derisking instruments completed; Jordan DEEI report published and disseminated. | Activity 3.4.2: Quantify the policy and financial derisking instruments using UNDP's validated DEEI methodology to establish their effectiveness. | | x | x | | | GAM, UNDP | GEF | 71200, 71300, 71400, 71600 | 138770 |
| | Activity 3.4.3: Carry out a stakeholder mapping exercise to establish which instruments are already being implemented and which ones require support (or additional support) | | x | x | | | GAM, MOPIC | GEF | 71200, 71300, 75700 | 7700 |
| | Activity 3.4.4: Publish a report featuring the results of Activities 3.4.1 through to 3.4.3. | | | x | | | GAM | GEF | 74200 | 11900 |
| | Activity 3.4.5: Disseminate the report through the project and UNDP websites; among development partners; and through a national workshop. | | | x | | | GAM, UNDP | GEF | 71600, 75700 | 5020 |
| Output 3.5: Lessons learnt, experiences and best practices related to the project are compiled and disseminated in other cities of Jordan and MENA countries.<br><br>Indicator 3.5.1: Project website developed and maintained.<br><br>Indicator: 3.5.2: Lessons learned and best practices study completed and disseminated.<br><br>Baselines (2017): No project website and no lessons learned report.<br><br>Target (2017): Project website is developed.<br><br>Target (2021): Lessons learned and best practices study completed and results disseminated. | Activity 3.5.1: Study completed to compile lessons learned, and best practices developed by the project. | | | | | x | GAM | GEF | 71200, 71400, 71600 | 47770 |
| | Activity 3.5.2: Publication of lessons learned report. | | | | | x | GAM | GEF | 74200 | 10000 |
| | Activity 3.5.3: Development of a project website, its integration in the GAM website, and maintenance over project lifetime. | x | x | x | x | x | GAM | GEF | 71300 | 14800 |
| | Activity 3.5.4: Dissemination of results of lessons learned and best practices through (1) national workshop involving other municipalities; (2) project website and other online forums. | | | | | x | GAM | GEF | 71600, 75700 | 7020 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL FOR COMPONENT 3 | | | | | | | | | | $490,000 |
| Outcome 4: Selected proof-of-concept mitigation interventions. | | | | | | | | | | |
| Output 4.1: 2 new private-sector residential buildings integrating best-practice resource efficiency measures/technology are supported.<br><br>Indicator 4.1: Number of Energy Performance Certificate issued.<br><br>Baseline (2017): No buildings with Energy Performance Certificate.<br><br>Target (2021): Two private sector residential buildings issued with Energy Performance Certificate. | Activity 4.1.1: Implementation of thermal insulation according to Thermal Insulation Code as per design approved by GAM to issue Building Permit. | x | x | x | | | GAM | GEF | 72200 | 340540 |
| | Activity 4.1.2: Implementation of water efficient devices and fixtures to enhance the baseline design. | | x | x | | | GAM | GEF | 72200 | 55000 |
| | Activity 4.1.3: Onsite inspection and monitoring by the Sustainable Development Department (SDD) of the implementation of thermal insulation as per the conditions pursuant to the Building Permit. This activity is linked to Activity 2.2.2. | x | x | x | | | GAM | | | 0 |
| | Activity 4.1.4: Issuance of Energy Performance Certificate and registration of building (related to Activity 2.7.3). | | | | x | x | GAM | | | 0 |
| | Activity 4.1.5: Monitoring of the energy performance of new buildings, and water use in buildings, and application of MRV system developed under Activity 3.1.2 for tracking GHG emission reductions. | x | x | x | x | x | GAM | | | 0 |
| Output 4.2: 2 existing public-sector buildings integrating best practice resource efficient/technology measures supported.<br><br>Indicator 4.2: Number of public sector buildings retrofitted.<br><br>Baseline (2017): No public buildings have been retrofitted with thermal insulation and water efficient measures. | Activity 4.2.1: Technical design for retrofitting building envelope insulation, and proposal for enhancing water efficiency. | x | x | | | | GAM | GEF | 71300 | 24000 |
| | Activity 4.2.2: Launching tendering process for contracting out retrofits. | | x | | | | GAM | GEF | 71300 | 2400 |
| | Activity 4.2.3: Implementation, including inspection, of technical design using the Retrofit Guidelines and technical manual developed under | | x | x | x | | GAM | GEF | 72200 | 537620 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Target (2021): 2 public sector buildings retrofitted with thermal insulation and water efficient measures. | Output 2.3. | | | | | | | | | |
| | Activity 4.2.4: Monitoring of the energy performance of retrofitted buildings, and water use in buildings, and application of MRV system developed under Activity 3.1.2 for tracking GHG emission reductions. | x | x | x | x | x | GAM | | | 0 |
| Output 4.3: Updated EE Lighting Code and smart usage system in place for all GAM lights.<br><br>Indicator 4.3: Number of smart lighting system installed.<br><br>Baselines (2017): No smart lighting system in place.<br><br>Targets (2019 and 2021): 40% (2019) and 100% (2021) of outdoor lighting that can benefit from smart usage system fitted with same. | Activity 4.3.1: EE Lighting Code updated. | x | x | | | | GAM | GEF | 71200, 71300, 71600, 75700 | 24275 |
| | Activity 4.3.2: Technical analysis for guiding choice of smart lighting usage system according to lighting applications. | x | | | | | GAM | GEF | 71200, 71300, 71600 | 14775 |
| | Activity 4.3.3: Smart lighting usage system implemented by GAM. | | x | x | x | | GAM | GEF | 72200 | 202990 |
| | Activity 4.3.4: Monitoring of lighting energy consumption in GAM, including PV lighting systems implemented under Output 4.4. | | x | x | x | x | GAM | | | 0 |
| Output 4.4: Stand-alone PV street lighting installed in GAM using the most energy efficient and site appropriate lighting technology available (e.g. LEDs)<br><br>Baseline (2017): No systematic use of standalone street or outdoor PV lighting; existing systems are poorly maintained and mostly non-operational.<br><br>Target (2019): 570 units of PV lighting system using LEDs and light sensors installed. | Activity 4.4.1: Technical analysis for guiding choice of PV lighting system, siting plan, and for developing procurement documents | x | | | | | GAM | GEF | 71300 | 8000 |
| | Activity 4.4.2: PV lighting implemented by GAM | | x | | | | GAM | GEF | 72200 | 164900 |
| | Activity 4.4.3: Monitoring of PV lighting operation and maintenance by GAM | | x | x | x | x | GAM | | | 0 |
| TOTAL FOR COMPONENT 4 | | | | | | | | | | $1,374,500 |
| Project Management | | | | | | | | | | |
| | Inception workshop | x | | | | | | GEF | 75700 | 5000 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Salary of Project staff | x | x | x | x | X | | GEF | 71400 | 45360 |
| | International consultant (M&E) | | | x | | X | | GEF | 71200 | 18665 |
| | Direct Project Costs | x | x | x | x | x | | GEF | 74599 | 35894 |
| | Project Audits | x | x | x | x | x | | GEF | 74100 | 15000 |
| | Travel | | | x | | x | | GEF | 71600 | 5581 |
| Total for Project Management | | | | | | | | | | $125,500 |
| TOTAL FOR THE YEAR 2017-21 | | | | | | | | | | $2,740,000 |

## ANNEX B: MONITORING PLAN

**Monitoring Plan:** The Project Manager will collect results data for the indicators given in the Project Results Framework (Section 5) and the Multi-Year Work Plan (Annex A). The Monitoring & Evaluation Plan given in Section 6 will be used.

## ANNEX C: EVALUATION PLAN

**Evaluation Plan:**

| Evaluation Title | Planned start date Month/year | Planned end date Month/year | Included in the Country Office Evaluation Plan | Budget for consultants[70] | Other budget (i.e. travel, site visits etc.) | Budget for translation |
|---|---|---|---|---|---|---|
| **Mid-term Review (MTR)** | *May 2020* | *July 2020* | *Mandatory* | *US$ 30,400* | *US$ 8,700* | |
| **Terminal Evaluation** | *September 2022* | *November 2022* | *Mandatory* | *US$ 31,200* | *US$ 9,720* | |
| | | | **Total evaluation budget** | US$ 80,020 | | |

[70] The budget will vary depending on the number of consultants required (for full size projects should be two consultants); the number of project sites to be visited; and other travel related costs. Average # total working days per consultant not including travel is between 22-25 working days.

## ANNEX D: GEF TRACKING TOOL AT BASELINE

(PROVIDED SEPARATELY)

## ANNEX E: TERMS OF REFERENCE FOR KEY PROJECT POSITIONS

(PROVIDED SEPARATELY)

## ANNEX F: UNDP SOCIAL AND ENVIRONMENTAL AND SOCIAL SCREENING (SESP)

(PROVIDED SEPARATELY)

## ANNEX G: CAPACITY ASSESSMENT OF GAM AND HACT MICRO ASSESSMENT

(PROVIDED SEPARATELY)

## ANNEX H: CO-FINANCING LETTERS

(PROVIDED SEPARATELY)

(Three letters of support are also provided separately)

## ANNEX I: UNDP DIRECT PROJECT SERVICES COSTS - LOA

(PROVIDED SEPARATELY)