

MINUTES OF MEETING OF TECHNICAL COMMITTEE FOR GEF 5: UNIDO MAEESTA PROJECT			No: 1/2017
Minuted by: Hasimah Hasan	Date: 27 th July 2017	Time: 2.30 – 5.00pm	Venue: Bilik Mesyuarat Utama, Tingkat 1, SIRIM
<div>Agenda</div> <div><div>1. Welcoming remarks by Chairman</div><div>2. Matters Arising</div><div>3. Discussion on the criteria selection for the demonstration project</div><div>4. Presentation on the proposals for the demonstration project</div><div>5. Discussion on the proposals to be approved by NPSC</div><div>6. Review on the activities of the project components</div><div>7. Other matters</div><div>8. Adjourn</div></div>			
Attendees	Organisation	Absent	
1. Tn. Haji Mohd Fauzi Ismail (Chairman)	SIRIM	Representative from MIDA	
2. Mr. Paul Wong Kok Kiang	KeTTHA	Representative from MGTC	
3. Mr. Mohamad Nadhir Zainal Abidin	ST		
4. Tuan Haji Hamdan Mokhtar	SIRIM		
5. Prof Dr. Sohif Mat	SERI, UKM		
6. Tn.Haji Omar Jusoh	NOSS		
7. Ir. Dr. Philip Tan	FMM		
8. Dr Azmi Idris	PMU		
9. Mohamad Iskandar Majidi	PMU		
Also attended			
10. Mohd Faisal Zulkapli	SIRIM		
11. Mrs Maznah Abd. Majid	SIRIM		
Secretary			
12. Mrs. Hasimah Hasan	PMU		

Agenda
<p>1. Welcoming remarks by Chairman</p> <p>1.1 The Chairman welcome all the TC members and thanks them for being able to attend the meeting. The Chairman highlighted the importance of the demonstration project and the TC's role to ensure the progress for the demonstration project component.</p> <p style="text-align: right;">Action: Information</p>
<p>2. Matters Arising</p> <p>2.1 Item 3.2: SERI commented that the mentioned company shall make the presentation for the project proposal. Dr Azmi explained that the company selection is made through the Expert Training Programme and Fast Track process, therefore the company is not ready until the report is completed. Thus the PMU and the consultant of the companies will do the presentation.</p> <p>2.2 Item 3.3: FMM commented that the organized training shall include the financial model for the project investment. FMM also offered to share the experience on the financial aspects for MAEESTA under the training programme.</p> <p style="text-align: right;">Action: PMU</p>
<p>3. Discussion on the criteria selection for the demonstration project</p> <p>3.1 SERI asked whether the sub sector for the demonstration project also include the hospitality sub sector. Dr Azmi clarify that NPSC and UNIDO agreed that hospitality is included in the sub-sector. The target for the demonstration project is one each for hotel and hospital.</p> <p style="text-align: right;">Action: Information</p> <p>3.2 KeTTHA commented that if the system cost shall be limited to MYR 2.0 million. Technical Committee members agreed that the criteria shall be amended as follow:</p> <p style="padding-left: 40px;"><i>"The maximum cost for the solar thermal system is MYR 2.0 million. UNIDO will cover maximum 20% of the system cost (excluding civil and structural works)"</i></p> <p style="padding-left: 40px;">change to;</p> <p style="padding-left: 40px;"><i>"UNIDO will cover 20% with maximum MYR 400k of the system cost (excluding civil and structural works)"</i></p> <p style="text-align: right;">Action: PMU</p> <p>3.3 Point on <i>"The grant will be paid direct to the company upon completion of the project and verified by UNIDO."</i></p> <p>SERI suggested that the UNIDO fund for the demonstration project shall be paid by the project progress. Since the UNIDO fund is reimburse after the project end, the</p>

company need to bear 100% cost at the earlier stage of investment. This can be a possible factor that hindered the company to invest for the demonstration project. Dr Azmi responded that PMU will clarify the matter after discussion with UNIDO.

3.4 Point on *“Willingness to share information about the project to other party/stakeholder to create awareness and knowledge sharing”*

SERI asked who is responsible for the promotion and knowledge sharing on the demonstration project for the public awareness. Dr Azmi responded that PMU will do compilation of the demonstration project for the case studies for public awareness.

Action: PMU

3.5 The final criteria selections agreed by the Technical Committee are:

- Registered entity under Company Act, 1965 or government entity
- Fall under targeted sub-sector
- Conducted complete feasibility study by UNIDO consultant
- Commitment from the company to implement and finance the project
- UNIDO will cover 20% with maximum RM400k of the system cost (excluding civil and structural works).
- The grant will be paid direct to the company upon completion of the project and verified by UNIDO.
- Willingness to share information about the project to other party/stakeholder to create awareness and knowledge sharing

Action: Information

4.0 Presentation on the proposals for the demonstration project

4.1 Proposal of demonstration project to be approved by NPSC

- Perusahaan Perkayuan Wan Feng
- MIWA Manufacturing Sdn Bhd
- Advanced Chicken Processing Sdn Bhd

Refer to the attachment for the slides presentation

4.2 FMM commented that for the financial part, the proposals shall put all the scenario to be compared and include data such as electricity cost used by the company, how much the cost of fuel will be replaced by the solar thermal, effect of the ITA in the cost of the investment and etc. PMU responded that proposal will be updated to include the comparison of the cost saving of using solar thermal technology with the existing system.

4.3 Proposal to carry out the energy audit for the company

- Secret Recipe Manufacturing Sdn Bhd
- NB Poultry Sdn Bhd

Refer to the attachment for the slides presentation

Action: PMU

5.0 Discussion on the proposals to be approved by NPSC

5.1 FMM suggested that the proposal need to have detail financial calculation for the investment.

5.2 The TC members agreed that all the proposals will be presented in the coming NPSC meeting. The proposals should be prepared in detail including the saving and GHG emission reduction for the project.

Action: PMU

6.0 Review on the activities of the project components

6.1 The project activities had been discussed and reviewed by PMU and SIRIM prior to the presentation to the Technical Committee. The Technical Committee agreed on the reviewed project activities with minor changes. PMU will make the necessary as suggested by the TC before presenting it to the NPSC.

Refer to the attachment on the project activities

Action: PMU

7.0 Adjourn

The meeting was adjourned at 5.00 pm

Prepared by:


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Hasimah Hasan

Secretary of Technical Committee

Date: 22nd June 2018

Approved by:


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Mohd Fauzi Ismail

Chairman of Technical Committee

Date: 25 June 2018

Proposal of demonstration project to
be approved by NPSC

SIRIM UNIDO PROJECT PROPOSAL

On

Solar Thermal Hot Water System for Jelly Drink Production Process

1	Name of Company	Miwa Jelly Drink Sdn Bhd
	Registration No	1155226-X
2	Sector	Food And Beverages
3	Address	No. 32G Jalan DC 4/3, Desa Coalfields 47000, Sungai Buloh, Selangor
	Telephone	012-9070680
4	Contact Person	FARA ELLIZA RASHID
5	GPS Coordinate	
6	Operating hours	8.00am-6.00pm Monday to Saturday
7	Products	Jelly Drinks
8	Electricity tariff category	B Commercial
9	Employees	15
10	Sales turnover	RM 1-2 Million

Hot water demand and supply

- Daily production of the jelly drinks is approximately at 3,200 liters per day. The products is packed in 10 ml cup-type packaging. The process starts with mixing raw materials with 400 liters of hot water at temperature of 75°C. Then it follows by filing and sealing processes. The current operation takes around 45 minutes to heat up the fresh water to 75°C by using electric boiler.

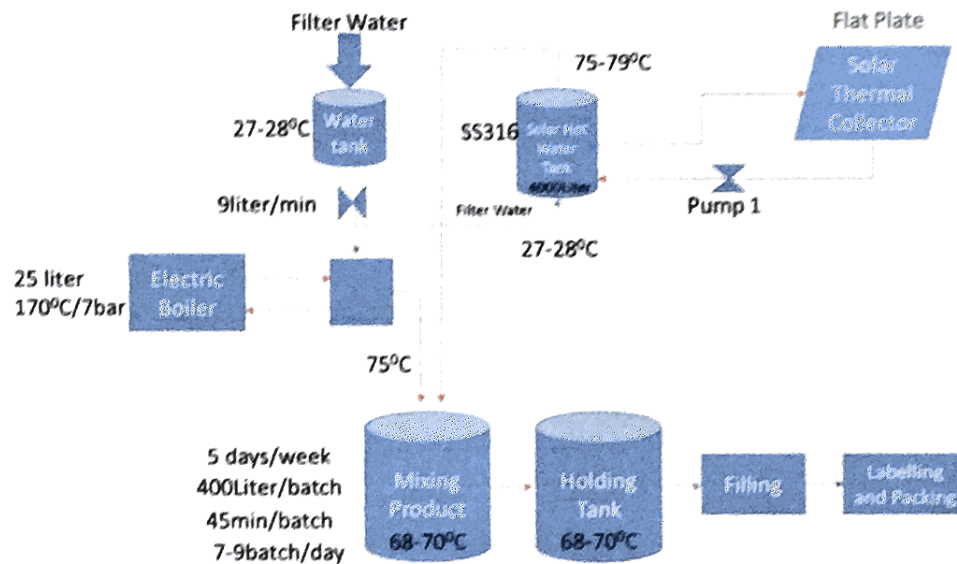
Justification

The proposed project is to integrate the hot water production from the electric steam boiler and the hot water system from the solar energy. The water temperature needs to be retained at 80°C which can be achieved by using solar hot water system. If 4,000 liter hot water can be produced by solar hot water system and is stored in a hot water tank, the hot water can be made available for the process. The process time can be shortened and more jelly drinks can be produced daily hence increase the production capacity.

This will reduce the electricity bill hence reduce its operational cost as well as reducing the CO₂ emission. Indirectly, it will contribute to national renewable energy uptake and national CO₂ reduction potential.

Concept design for Miwa Jelly

Miwa Jelly Solar Thermal System



Project Benefit

- The project can reduce electricity consumption and increase the production.
- Using solar as source of energy can reduce CO2 emission and contribute to reduction national fossil fuel demand and electricity demand

Project Cost

	Activity	Project Cost (RM)	Source of Funding
1.	Detail energy audit	10,000.00	SIRIM/UNIDO
2.	Detail engineering design	40,000.00	SIRIM/UNIDO
3.	Technical specifications preparation	10,000.00	SIRIM/UNIDO
4.	Procurement solar thermal process (Solar collector, hot water tank, pumping, piping and control system)	200,000.00	SIRIM/UNIDO (20% by UNIDO)
5.	Monitoring, commissioning and performance assessment	30,000.00	SIRIM/UNIDO
6.	Project completion report	10,000.00	SIRIM/UNIDO
	TOTAL	300,000.00	SIRIM/UNIDO

Conclusion

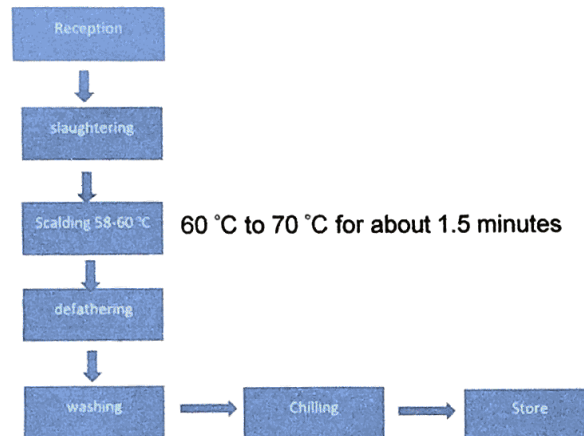
The process has potential for solar thermal application and the management is interested to replace the old boiler to solar thermal system.

1	Name of Company	Advance Chicken Processing (M) Sdn Bhd
	Registration No	914722-T
2	Sector	Agriculture (Poultry processing)
3	Address	Lot 8, Kawsan Perindustrian Jejawi, 02600 Arau, PERLIS
	Telephone	04-9772645 04-9762645
4	Contact Person	1. Mr Ong Sheng Tatt (012-5686162) 2. Mr Mohammad Jannah
5	GPS Coordinate	
6	Operating hours	6.00pm-9.00 am Monday to Saturday
7	Products	Process chicken (whole & pieces) and Frozen Process chicken (whole & pieces)
8	Electricity tariff category	B Bommercial
9	Employees	60
10	Sales turnover	RM 35 Million – Medium Company



Advance Chicken Processing Sdn Bhd, Jejawi,Perlis.

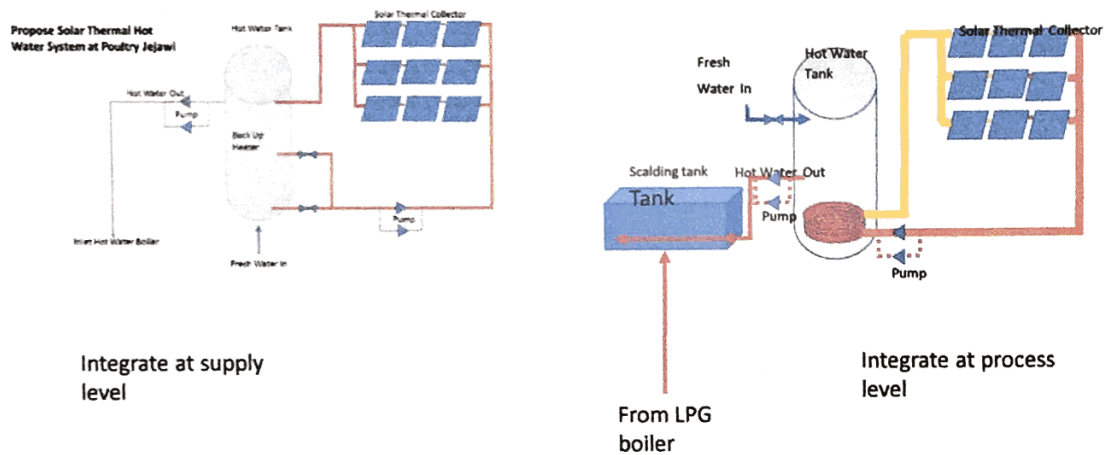
- The company is processing on average 10,000-14,000 chicken/day which require hot water in the range 60-70 ° C for scalding process. Best practice suggest the hot water requirement is 1.0 litre/chicken. This means the hot water requirement can reach 14,000 litres/day.
- Currently the scalding process has one tank heated by LPG. The LPG consumption is about 50 kg/day The hot water is generated by the LPG hot water boiler system.



Justification

- The company is plan to double the processing capacity and require double the amount hot water may be 25,000-28000 l/day
- The existing LPG hot boiler cannot meet the hot water demand and need to purchase new hot water system.
- A solar hot water system can be an option

Conceptual design



Project Benefit

- The project can provide solution for extra hot water demand required.
- Solar is free energy option with some investment . However feasibility study should be carried out.
- Using solar as source of energy omit CO2 emission as compare to using electricity or other fossil fuels

	Activity	Project Cost (RM)	Source of Funding
1.	Detail energy audit, and feasibility study	60,000.00	SIRIM/UNIDO
2.	detailed engineering design and specifications preparation	40,000.00	SIRIM/UNIDO
3.	Procurement solar thermal process (Solar collector, hot water tank, pumping, piping and control system)	320,000.00	SIRIM/UNIDO
4.	Monitoring, commissioning and performance assessment	20,000.00	SIRIM/UNIDO
	TOTAL	420,000.00	SIRIM/UNIDO

Conclusion

The process plant has need extra hot water for expansion . Solar water heating can be an option. Further work are needed to

- carry out detail investigation of current system and operation
- Evaluate heat supply and demand, load profile, sensitivity to changes and possible solar fraction and study the expected heat demand profile.
- quantify the hot water consumption and the energy used for current process and expected increase in consumption
- do comparative study on several water heating options
- do detailed analysis on the requirement and sizing of the solar thermal system detail study need to be carried out

Solar Thermal Proposal for Perusahaan Perkayuan Wan Feng Sdn Bhd

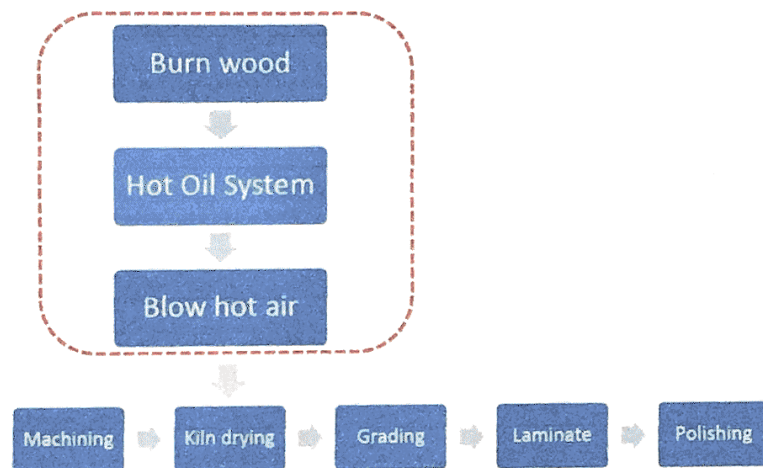


Off Jalan Pulapol (Jalan Bypass), Batu Anam,
85100 Segamat, Johor

Company Info

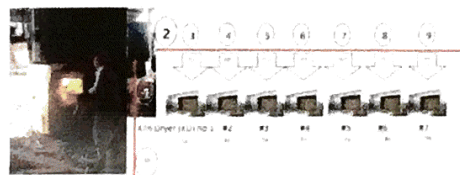
- SME involve in processing of timber with 60% output for export market
- Privately-owned saw mill with a capacity to process around 800-meter cube of timber monthly
- Mr. Tan, the MD, is a trainee in the second batch expert Course 1 training
- Off-cut wood is used as fuel while excess are sold
- Operate 7200 hours per annum

Process Flow & Heat Stream



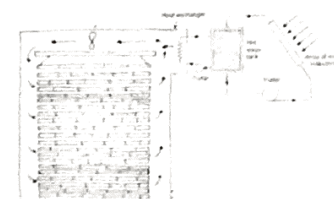
Description of the existing system

- Burnt 2 ton/day of off-cuts to provide heat to 7 kiln dryers
- Thermal Oil Temp: Supply 160°C, Return 150°C
- Kiln Chambers Temp: 60-70°C
- Drying Requirement: From 30-40% to 10-14% m.c.
- Kiln Chamber size: 20' x 30' x 18'
- Kiln Chamber Heat Demand: 10kW_{th}
- 4 new similar size kilns being constructed
- 2 similar sized decommissioned kilns that was operating using heat pump
- Owner planning to purchase another boiler that would be used as standby



Proposed Demo Project

- Retrofit 2 decommissioned kiln to use solar thermal collectors & storage
- Daily Heat required: $480\text{kWh}_{\text{th}}$
- Proposed collector size: 120m^2
- Project Cost: RM468,000
- Project Benefits:
 - Monetary saving on off-cuts, boiler maintenance & boiler Operation, in-direct GHG reduction
- Simple Payback: 9 yrs



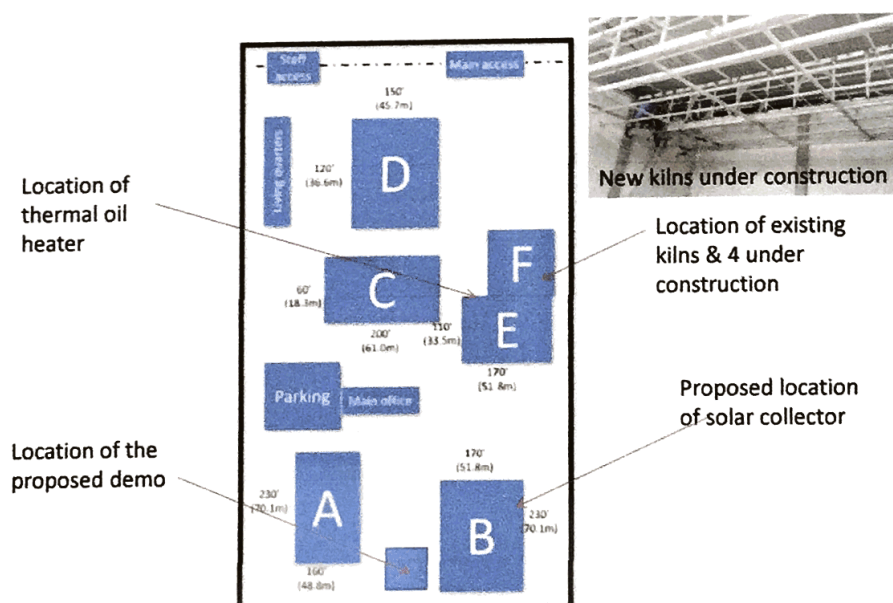
Comparison

Item	Boiler	Solar Thermal
Investment	Low	High
Back Up System	Yes	No
Fuel Cost	+RM70000/yr	none
O&M Cost	+RM20000/yr	minimal
GHG Reduction	-	indirect
Operating Cost over 10yr (5-10% increase per yr)	RM1,368,000.00	some

Source of Funding

No	Activity	Source of Funding		Project Cost (RM)
		UNIDO	COMPANY	
1	Detail energy audit	6,000		6,000
2	Detailed engineering design and feasibility study	10,000		20,000
3	Technical specifications preparation	10,000		
4	Procurement solar thermal process (Solar collector, hot water tank, pumping, piping and control system)	85,400	341,600	427,000
5	Monitoring, commissioning and performance assessment	10,000		10,000
6	Project completion report	5,000		5,000
	TOTAL	126,400	341,600	468,000
	PERCENTAGE	27%	73%	100%

Site Plan



Proposal to carry out the energy audit for the company

PROPOSAL FOR SECRET RECIPE MANUFACTURING

on

Solar Thermal Hot Water System

General information of the company

Name of Company	Secret Recipe Manufacturing Sdn. Bhd.		
Business	Food & Cake Manufacturing		
Contact Person	En. Izwan Bin Omar (Plant Engineer) Cell No. 6018 205 1183 izwan@secretrecipe.com.my		
Address	Nouvelis Industrial Park Lot 10, No.5 & 6, Lorong Teknologi 3/4B, Taman Sains Selangor 1, Kota Damansara, 47810 Petaling Jaya.		
GPS Coordinate			
Year of construction	2015		
Phone No.	603 6143 5378	Faks No.	603 6143 5078
Operating hours	8.30 A.M. – 10.00 P.M. (14.5 hours)		
Products	Cakes, brownies and Hokkaido tart LARGE COMPANY		
Electricity Tariff Category	B Commercial		

Hot water demand and supply

- Daily production need hot water for cleaning purposed



Justification

The company need large amount of hot water to clean the utensils for making cakes. Currently hot water is produced using electrical and the hot water storage is small. The hot water produce and stored cannot meet the demand of the hot water required for cleaning.

The company is planning to produce more products and the demand for hot water will increase. The management is looking for a solution to produce hot water and welcome solar water heating system.

Project Activity

work item	Activities
1 feasibility assessment	Detail investigation of current system and operation
i) Thermal Energy audit and Analysis of the current situation	Evaluation of heat supply and demand, load profile, sensitivity to changes and possible solar fraction and select the integration point
ii) Analysis of integration point	
2 System design	identify suitable collectors and necessary area, storage volume, type of heat exchangers, control system proposed solar fraction and yield compare technical and economic facts for ranking
i) Evaluation of integration concept	
ii) Detail engineering design	
iii) Technical Specification	prepare specification for tender document
3 Procurement	i) ii) Procurement
4 Supply, install and commissioning	i) Supply the system and install at site
5 Monitoring the performance of the solar thermal system	At least 6 months monitoring after commissioning

Preliminary Spec and Project Cost

- Hot Water Capacity: 15,000 liter at 70°C
- Thermal Energy Required : 605Kwh (thermal)
- Gross Area : 290m²
- Absorber area : 226m²
- No of Tube : 2100 units
- Estimated total Project Cost : RM 930,000

Conclusion

The process has potential for solar thermal application and the management is interested to replace the old storage heater to solar thermal system.

Solar thermal for producing hot water in Poultry Processing industries



Introduction

Food water and energy are very important resources in our life

Chicken is considered one of the cheap source of protein in Malaysia. Hence Poultry Industry in Malaysia is one of the important industry to provide cheap protein for the people.

Poultry processing use hot water for the scalding process as well for cleaning . In many processing plants the hot water is generated using conventional method using boilers (electric or fossil fuels such as diesel & LPG).

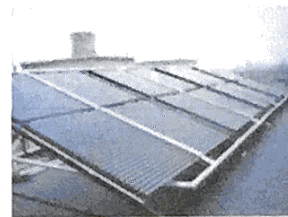
Using solar energy to generate hot water will save energy cost for company reduce fuel import for Malaysia which in turn better for our energy security .

Using energy from the sun

Malaysia is having good sunshine almost throughout the year. The Malaysian Industries should take advantage of the free energy

Using solar hot water system in food industry means

- having free energy (just pay for the system) for the process heat
- Create better image for the company by using clean and sustainable energy
- Improve renewable share in the energy supply mix for the country
- Better for environment and human health.

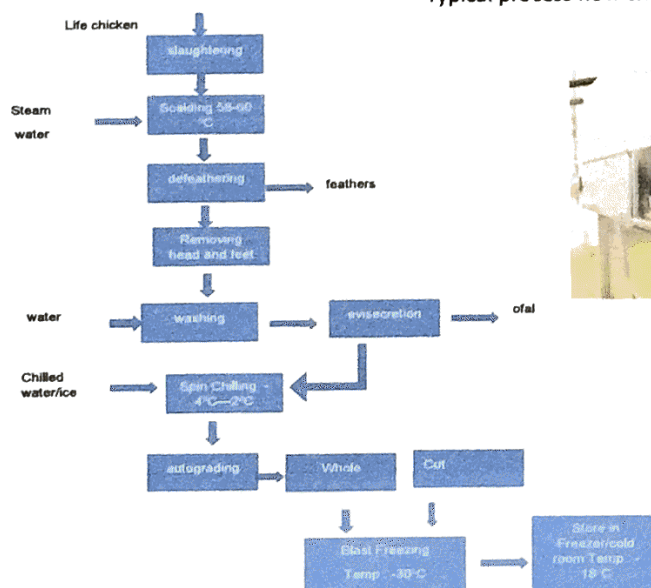


Proposal

1. NB Poultry Processing Sdn Bhd
2. Advance Chicken Processing Sdn Bhd, Jejawi, Perlis

1	Name of Company	NB Poultry Processing Industries Sdn Bhd
	Registration No	668786-T
2	Sector	Agriculture (Poultry processing)
3	Address	Lot PTD 7904 KG PT BARU PT SELANGOR BT 31 82000 PONTIAN JOHOR
	Telephone	07-688 1408
4	Contact Person	MUHAMAD AZIZUL HAKIM BIN HAMZAH
5	GPS Coordinate	
6	Operating hours	6.00am-6.00pm Monday to Saturday
7	Products	Frozen Process chicken (whole & pieces)
8	Electricity tariff category	B Bommercial
9	Employees	196 By definition still SME (whichever lower)
10	Sales turnover	RM 100 Million

Typical process flow chart for poultry industry



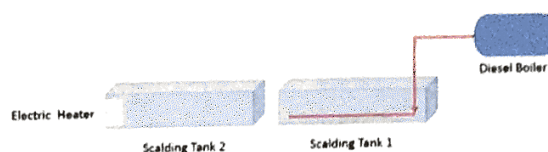
Hot water demand and supply

- The company is processing on average 40,000 chicken/day which require hot water in the range 50-60°C for scalding process. Best practice suggest the hot water requirement is 0.25 gal/chicken. This means the hot water requirement is 10,000gallon/day 37,850litres/day.
- Currently the scalding process has two tanks one tank is heated by steam and another by electrical heater. The steam is generated by the old diesel boiler. The efficiency of the boiler is not known. The manager is not satisfied with the boiler and need a better system.

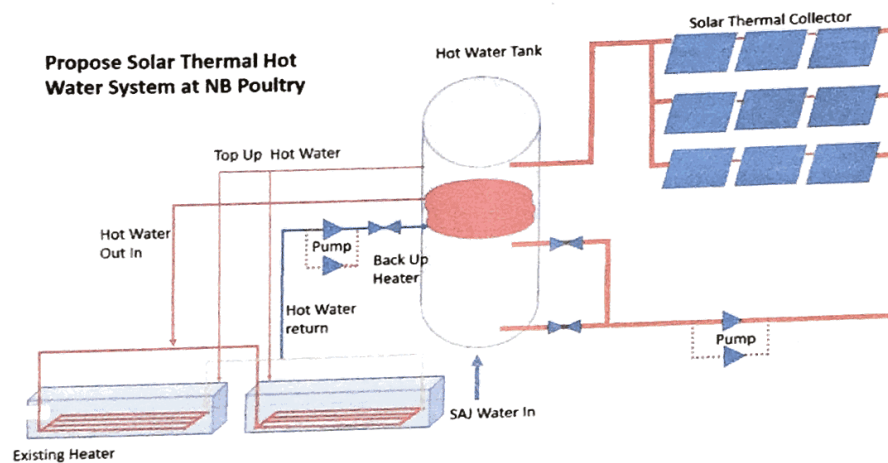
Justification

The management is currently in the process of upgrading the equipment in the plant. They are not satisfied with the existing boiler because it cannot support the water heating required by the production process. The heating need to be supplemented by electrical boiler. They also want to change to a better system and welcome solar thermal technology.

The current scalding energy supply is as shown in figure 1



Concept design for NB Poultry



Project Benefit

- The project can provide free energy for the scalding process. Depending on the solar fraction and the system design the energy purchase reduction for the scalding process can be in the range 30-80%. Reduction in electricity use for scalding which amounting 36% of the electricity cost. Reduce in diesel purchase. Reduction in energy cost means greater profit for the company.
- Using solar as source of energy can reduce CO₂ emission and contribute to reduction national fossil fuel demand and electricity demand

	Activity	Implementer	Project Cost (RM)
1	Feasibility		50,000
2	System Design and specification		30,000
3	Procurement process		1000
4	Estimate system cost		1,381,115
5	Performance monitoring		20,000
6	Documentations (final report, pictures, video, etc)		2000
JUMLAH / TOTAL			1,484,115

Conclusion

The process plant has potential for solar thermal application and the management is interested to change the old boiler to more efficient system. Further work is needed to

- carry out detail investigation of current system and operation
- Evaluate heat supply and demand, load profile, sensitivity to changes and possible solar fraction and select the integration point
- quantify the hot water consumption and the energy used for scalding process
- do detailed analysis on the requirement and sizing of the solar thermal system detail study need to be carried out

Project Activities

COMPONENT 1:

Development of *regulatory framework, support programme and financial incentive mechanism* to facilitate solar thermal energy utilization

Output 1: Assessment of regulations and policy			
Action Plan	Deliverables	Resources	Agency
Review of Incorporate thermal energy in Green technology policy, RE policy, NEEAP	One Policy recommendation	KETTHA, ST, SEDA, MGTC	- PwC, outcome of solar thermal roadmap
Solar thermal industry gap analysis and develop solar thermal roadmap	Solar thermal deployment roadmap	MIGHT, SEDA, ST, KETTHA, MOSTI & SIRIM, SERI	PwC, UNIDO
Implement stakeholder Engagement Program: i. Government (Industrial Dev. Authority & Local Authority ii. Industry iii. Financial Institution	Workshop, seminar, industrial visit, report papers, focus group discussion (FGD), expert bank	DOS, MOE, various ministries, FMM, industries, financial institution, local authorities	SIRIM and PMU
Establish national data for thermal energy through association, FMM, DOSH, MPMA, MPIA, MAESCO	Statistics and data publication for thermal energy in industry	Registration of boilers by DOSH, Dept. of Statistic	Dept. of Statistic

COMPONENT 1:

Development of *regulatory framework, support programme and financial incentive mechanism* to facilitate solar thermal energy utilization

Output 2: Assessment of institutional capacity strengthened, including international experiences shared with government stakeholders			
Action Plan	Deliverables	Resources	Agency
Assessment of policy and programs by other countries (ASEAN, European, China, APEC)	Report	IEA publications, European (ESTIF), ASEAN (ACE)	PwC -outcome from roadmap
Hosting a national seminar on SHC annually	Seminar	MOSTI, KETTHA, SIRIM	SIRIM, UNIDO
International collaboration	MOU, transfer technology, agreement (market access)	MOSTI, MITI, MIGHT, MIDA, SIRIM	SIRIM, UNIDO

COMPONENT 1:

Development of regulatory framework, support programme and financial incentive mechanism to facilitate solar thermal energy utilization

Output 3: Assessment of financial support program (incentive)

Action Plan	Deliverables	Resources	Agency
Review of existing fiscal/financial incentives – GTFS, GITE, GITA, 1Innocert, Pioneer status	Performance evaluation and recommendation	MIDA, SME-CORP, MGTC	Include in roadmap
Matching industry and financial institution	Workshop with industry, financial institution and financial instruments	MDV, MGTC, MiGHT	-PwC, PMU: outcome from roadmap
Determine HS code for each components of solar thermal system for import duty exemption	Import duty exempted for solar thermal system and components	MIDA, MITI, CUSTOMS, industries, FMM	-PwC, PMU: outcome from roadmap
Develop mechanism for solar thermal contribution in national energy policy	Long term projection of solar thermal in energy mix	ST, KETTHA, JPPPET, EPU	PwC, PMU: outcome from roadmap

Output 4: Assessment of non-financial support program

Action Plan	Deliverables	Resources	Agency
Develop national standard on solar thermal system	National standard developed	SIRIM, Standards Malaysia	SIRIM, NOSS, PwC, PMU: outcome from roadmap

COMPONENT 2:

Awareness raising and capacity building program relating to process heating and cooling optimization, and solar thermal energy utilization

Output 1: Skills and competency strengthened for service providers, consultants and industry in the implementation of energy savings based on process heating and cooling, in selected sub-sectors;

Action Plan	Deliverables	Resources	Agency
- Develop national competency and skill training for thermal energy efficiency	National competency standard module for thermal EE	AEE INTEC, SIRIM, SERI, FMM, SME Corp, JPK	SIRIM, NOSS
- User trainings at regional	Training modules		PMU, SIRIM
- Expert training	Trained personnel		

COMPONENT 2:

Awareness raising and capacity building program relating to process heating and cooling optimization, and solar thermal energy utilization

Output 2: Skills and competency of equipment or component suppliers, service providers, consultants and industry in solar thermal technology improved;

Action Plan	Deliverables	Resources	Agency
- Competency and skills training for designer and installer	Competency standard on solar thermal installation. Competency standard on solar thermal design	AEE INTEC, SIRIM, SERI, FMM, SME Corp, KETTHA, MOHR	NOSS, SIRIM
- User trainings at regional - Expert training	Training modules Trained personnel		

COMPONENT 2:

Awareness raising and capacity building program relating to process heating and cooling optimization, and solar thermal energy utilization

Output 3:

Enhanced **awareness** among **industry management** and **financial institutions** in order to take decisions on investments in energy saving and solar thermal application (including using cases study results of component 3).

Action Plan	Deliverables	Resources	Agency
Widespread awareness program, outreach program, road shows on solar thermal cover six regions to industries	Database of participants Report	FMM, SME Corp,	
Awareness through media coverage	Website, Newsletter and publication	SIRIM, UNIVERSITY, MEDIA, FMM	UNIDO

COMPONENT 3:*Demonstration and scaling up of sector-specific EE and solar thermal energy utilization in targeted industrial subsectors***Output 1:**

Energy Saving measures and investment projects implemented in about 40 companies

Action Plan	Deliverables	Resource	Agency
Identify the companies for the energy audit at SME and GLC/MNC	40 companies identified	FMM SME Corp SIRIM MAESCO SERI	
Conduct energy audit	Energy audit report submitted		
Identify energy EE measures and investment	Identify EE measures		
Technical feasibility assessment (TFA)	report submitted with TFA Implementation Process Flow format developed		

COMPONENT 3:*Demonstration and scaling up of sector-specific EE and solar thermal energy utilization in targeted industrial subsectors***Output 2:**

Of these 40 factories, 10 will implemented solar thermal demonstration projects

Action Plan	Deliverables	Resource	Agency
Identify 10 pilot plant projects with detail engineering design and system optimization and Technical Feasibility Analysis (TFA)	<ul style="list-style-type: none"> - Data compilation and project viability. - At least 10 companies committed and confirm for the implementation of the main project. - Acquire financial support to implement the project. 	FMM SME Corp SIRIM MAESCO SERI	
Identify local technology providers and system integrator	Develop database of local technology providers and system integrator Project commissioning report		

COMPONENT 3:

Demonstration and scaling up of sector-specific EE and solar thermal energy utilization in targeted industrial subsectors

Output 3:

Case studies prepared and presented under Output 2.3 to raise investment in EE and solar thermal integration using the trained capacity and various financing mechanisms created.

Action Plan	Deliverables	Resource	Agency
Findings of 40 industrial assessment in EE and solar thermal	Report and document	FMM SME Corp SIRIM MAESCO SERI	
Seminar for case studies to the industry takers and stakeholders	Organize seminar, business case study		
Study tour of international best practices solar thermal case study	One international study tour		