

## JCM Sustainable Development and Safeguards Assessment Report

Project description	
Title	Introduction of 30MW Rooftop Solar Power System to Large Supermarkets
Project participant (Thai)	Impact Electrons Siam Co., Ltd. & Impact Solar Limited
Project participant (Japanese)	Sharp Energy Solutions Corporation
Project location	<p>Supermarket 1 (Pathum Thani) 996.48kW 41/10 Moo 3, Ban Chang, Mueang, Patumthani, 12000</p> <p>Supermarket 2 (Ayutthaya) 996.48kW 80 Moo 2, Ban Krod, Bang Pa-in, Phra Nakhon Si Ayutthaya, 13160</p> <p>Supermarket 3 (Buriram) 766.08kW 150 Moo 7, Isan, Mueang, Buriram, 31000</p> <p>Supermarket 4 (Chaiyaphum) 996.48kW 99 Moo 1, Bung Khla, Mueang, Chaiyaphum, 36000</p> <p>Supermarket 5 (Namyuen) 432.00kW 199 Moo 15, Si Wichian, Nam Yuen, Ubon Ratchathani, 34260</p> <p>Supermarket 6 (South Pattaya) 996.48kW 565/41 Moo 10, Nongprue, Bang Lamung, Chonburi, 20150</p> <p>Supermarket 7 (Lam Lukka) 996.48kW 10 Moo 12, Bueng Kham Phroi, Lam Lukka, Pathum Thani 12150</p> <p>Supermarket 8 (Wangnamyen) 443.52kW 916 Moo1, Wang Nam Yen, Wang Nam Yen, Sa Kaeo, 27210</p> <p>Supermarket 9 (Navanakorn) 996.48kW 98/196 Moo 13 Khlong Nueng, Khlong Luang Pathumthani 12120</p> <p>Supermarket 10 (Omyai) 992.25kW 17/17 Moo8, Omyai, Sampran, Nakhon Pathom, 73160</p> <p>Supermarket 11 (Ratchaburi) 996.48kW 534 Moo 1, Khoke Mor, Mueang, Ratchaburi, 70000</p> <p>Supermarket 12 (Hangdong2) 593.28kW 111 Moo 5, Hangdong, Hangdong, Chiangmai, 52030</p> <p>Supermarket 13 (Sukhothai) 996.48kW</p>

	68 Moo 2, Ban Kluai, Mueang, Sukhothai, 64000
	Supermarket 14 (Suksawat) 992.25kW 94 Moo 18, Bang Phueng, Phrapadaeng, Samutprakarn, 10130
	Supermarket 15 (Lumphun) 846.72kW 200 Moo 4, Ban Klang, Mueang, Lamphun, 51000
	Supermarket 16 (Yasothon) 996.48kW 323 Moo 2, Samran, Mueang, Yasothon, 35000
	Supermarket 17 (Lumpang) 996.48kW 65 Soptui, Mueang, Lampang, 52100
	Supermarket 18 (Tha Tako) 587.52kW 989 Moo 1, Tha Tako, Tha Tako, Nakornsawan, 60160
	Supermarket 19 (Phrae) 789.12kW 600 Moo 9, Nachak, Mueang, Phrae, 54000
	Supermarket 20 (Korat2) 875.52kW 103, NaiMueang, Mueang, Nakornratchasima, 30000
	Supermarket 21 (Suwannaphum) 576.00kW 12 Moo 5, Srakoo, Suwannaphum, Roi Et, 45130
	Supermarket 22 (Ladkrabang) 992.25kW 99/7 Moo1, Khlong Preng, Mueang Chachoengsao, Chachoengsao, 24000
	Supermarket 23 (Dankhuntod) 564.48kW 384 Moo 3, Dan Khun Thot, Dan Khun Thot, Nakornratchasima, 30210
	Supermarket 24 (Wichienburi) 552.96kW 157 Moo 4, Sapradu, Wichianburi, Phetchabun, 67130
	Supermarket 25 (Nakhornpathom) 996.48kW 754 Petchkasem Rd. Huayjarakae, Muang Nakhon Pathom, 73000
	Supermarket 26 (Hangdong1) 996.48kW 433/4-5 Moo 7, Mae Hia, Mueang, Chiangmai, 50000
	Supermarket 27 (Phang Khon) 512.64kW 506 Moo 8, Phang Khon, Phang Khon, Sakon Nakhorn, 47160
	Supermarket 28 (Thanyaburi) 915.84kW 158/17 Moo 4, Rangsit, Thanyaburi Pathumthani, 12110
	Supermarket 29 (Kham Ta Kla) 478.08kW

	<p>296 Moo 11, Kham Ta Kla, Kham Ta Kla, Sakon Nakhon, 47250 Supermarket 30 (Ban Dung) 633.60kW 500 Moo 9, Srisuttho, Bandung, Udonthani, 41190</p> <p>Supermarket 31 (Phetchaburi) 887.04kW 130 Moo 1, Ton Mamuang, Mueang, Phetchaburi, 76000</p> <p>Supermarket 32 (Chonburi2) 806.40kW 15/17 Moo 3, Huai Kapi, Mueang, Chonburi, 20000</p> <p>Supermarket 33 (Roi-Et) 702.72kW 320 Moo 10, Nuea Mueang, Mueang, Roi Et, 45000</p> <p>Supermarket 34 (Ban Phai) 581.76kW 100 Moo 6, Huanong, Ban Phai, Khon Kaen, 40110</p> <p>Supermarket 35 (Krabi) 997.92kW 349 Moo 11, Krabi Noi, Mueang, Krabi, 81000</p> <p>Supermarket 36 (Petchaboon) 997.92kW 939 Moo 2, Sadiang, Mueang, Phetchabun, 67000</p> <p>Supermarket 37 (Chantaburi) 997.92kW 1012 Talad, Mueang, Chanthaburi, 22000</p>
Latitude, longitude	<p>Supermarket 1: N14.0050, E100.5205 Supermarket 2: N14.3193, E100.61121 Supermarket 3: N14.9774, E103.07422 Supermarket 4: N15.77739, E102.02705 Supermarket 5: N14.4933, E105.0176 Supermarket 6: N12.9156, E100.8940 Supermarket 7: N13.93463, E100.71429 Supermarket 8: N13.5100, E102.1777 Supermarket 9: N14.1226, E100.61698 Supermarket 10: N13.70651, E100.28121 Supermarket 11: N13.5506, E99.8231 Supermarket 12: N18.66776, E98.91456 Supermarket 13: N17.01123, E99.77335 Supermarket 14: N13.6538, E100.52238 Supermarket 15: N18.591, E99.0412 Supermarket 16: N15.82773, E104.11475 Supermarket 17: N18.2755, E99.4812 Supermarket 18: N15.6353, E100.4763 Supermarket 19: N18.1284, E100.144 Supermarket 20: N14.9486, E102.0542 Supermarket 21: N15.5971, E103.8083 Supermarket 22: N13.692197, E100.901588 Supermarket 23: N15.1931, E101.7622 Supermarket 24: N15.651145, E101.087099 Supermarket 25: N13.8126, E100.072 Supermarket 26: N18.74496, E98.96208 Supermarket 27: N17.393359, E103.702359 Supermarket 28: N14.0258, E100.7433</p>

	Supermarket 29: N17.856384, E103.764704 Supermarket 30: N17.674374, E103.251090 Supermarket 31: N13.079, E99.9482 Supermarket 32: N13.315733, E100.96029 Supermarket 33: N16.0766, E103.6491 Supermarket 34: N16.048073, E102.713432 Supermarket 35: N8.10837, E98.92927 Supermarket 36: N16.398730, E101.138657 Supermarket 37: N12.59817, E102.09929
Project status	Operated since 1 August 2018

Report description		
Date of report completion	31-Jul-2025	
Version	1.0	
Corresponding author	Name	Mr. Sira Khamklai
	Title	Senior Vice President, Business Development and Chief Representative - Japan
	Organization	Impact Electronics Siam Co., Ltd.
	Telephone	
	E-mail	

Note:

- Related figures, documents, evidence related to the description may be attached as attachment.
- In the case where there is any other relevant issue that needs to be considered, it is be specified in the last row of each area of assessment.

### Certification letter

31/July/2025

I, the undersigned, hereby certify that Impact Electrons Siam Co., Ltd. (IES) is the author of the “Sustainable Development and Safeguards Assessment Report” of the project titled Introduction of 30MW Rooftop Solar Power System to Large Supermarkets developed by Impact Electrons Siam Co., Ltd. (IES) and Impact Solar Limited (ISL) located at multiple sites across Thailand as listed in Project Description section of this SDSAR.

The report was prepared by the team members as follows:

No.	Name	Position	Signature
1	<u>Patrapol Tangchitnamthamrong</u>	<u>Managing Director, ISL</u>	
2	<u>Suriyan Chanlot</u>	<u>Vice President - Asset Management, IES</u>	
3	<u>Sira Khamklai</u>	<u>Senior Vice President, IES</u>	

Signature

  
(Patrapol Tangchitnamthamrong)

Position ..... Managing Director, ISL .....

Seal (if any)

## Part 1: General information of the project area before project implementation

*Provide baseline information describing the conditions before project implementation. This data is essential for assessing the project's environmental, social, and economic impacts. Ensure the details are accurate and comprehensive to support a thorough evaluation.*

Area of Assessment	Description
<b>1. Environment and natural resources</b>	
1.1 Air pollution	The projects are located in several locations of Big-C supermarkets across Thailand as listed in Project Description section. No air pollution was found in the area
1.2 Water pollution	No surface water and ground water pollution problem were reported in the area.
1.3 Soil pollution	No soil pollution was reported in the area.
1.4 Noise pollution	No point sources of noise pollution were found in the area.
1.5 Odor pollution	No odor was reported in the area.
1.6 Water consumption	Tap water is the main source for consumption.
1.7 Solid waste/municipal solid waste	The relevant local administrative bodies regularly collect solid waste from the supermarkets. So, there is no leftover problem in the area.
1.8 Hazardous waste/infectious waste/electronic waste	No pollution from hazardous waste/ infectious waste /electronic waste was reported in the area.
1.9 Energy (i.e. Wasted Energy, Renewable Energy)	The supermarket used electricity from power grid.
1.10 Land Use	The project is in each designated supermarket area.
1.11 Biodiversity	Biodiversity was not relevant in the supermarket area.
1.12 Wild animal/ Aquatic ecosystem	No wild animal or aquatic ecosystem was found in the area.
1.13 Other (Please specify...)	-
<b>2. Society</b>	
2.1 Socio-cultural characteristics	Socio-cultural characteristics were those of a typical Bangkok suburb including rural residential area. The society comprises largely of the working class who engage in agriculture, manufacturing, service industry, and official work.

Area of Assessment	Description
2.2 Health and safety	There is no major concern in terms of health and safety in the area.
2.3 Traditions, cultures and/or valuable places worthy of conservation	The tradition and cultural values of the people in the area is commonly found in the central region of Thailand. There are no distinctive places of high conservation values.
2.4 Race, religion, and ethnic group	The majority of population in the area are of Thai origin who practices Buddhism.
2.5 Transportation	Primary mode of transportation in the area is private vehicles (cars, trucks and motorbikes). There is also a use of local public transport such as train, buses, vans.
2.6 Other (Please specify...)	-
<b>3. Economic</b>	
3.1 Overall local economy (i.e. income, expenditure, etc.)	The local economy in the area is largely driven by manufacturing, agriculture, and service sectors.
3.2 Employment/Career	Officials, merchants, factory workers, farmers, general service providers.
3.3 Major agricultural activity in the area	No agricultural activity in the area is found.
3.4 Major industry in the area	There are some factories including dairy product, automotive parts, manufacturing.
3.5 Major service sector in the area	Retail, restaurants, transportation are the main service sector in the area.
3.6 Basic infrastructure (i.e. road, school, etc.)	The basic infrastructure in the area includes transportation (road network, public transportation), utilities (electricity, water supply, waste management), education (schools), healthcare (hospitals and clinics) as well as telecommunications.
3.7 Other (Please specify...)	-

*\*Project Participant explains in detail of provenance and importance of issue consider about before project implement and specify if the project is rightful/environmental law, social, and economy. To have Negative impact assessment (Do-no-net-harm) with supporting documents.*

## Part 2 Sustainable Development Goals

### 2.1 Sustainable Development Contributions Assessment

Please mark ✓ in ☐ to identify the contributions of the proposed project to specific SDG. The project is required to contribute to **at least two SDGs, in addition to SDG13: Climate Action.**

Project Contributions to SDGs	Indicator (Please specify)	Description of Indicator
<input type="checkbox"/> SDG 1: No Poverty		
<input type="checkbox"/> SDG 2: Zero Hunger		
<input type="checkbox"/> SDG 3: Good Health and Well-being		
<input type="checkbox"/> SDG 4: Quality Education		
<input type="checkbox"/> SDG 5: Gender Equality		
<input type="checkbox"/> SDG 6: Clean Water and Sanitation		
<input checked="" type="checkbox"/> SDG 7: Affordable and Clean Energy	Amount of renewable energy generated electricity (Unit: MWh)	Increase proportion of renewable energy in national energy consumption
<input type="checkbox"/> SDG 8: Decent Work and Economic Growth		
<input checked="" type="checkbox"/> SDG 9: Industry, Innovation and Infrastructure	CO2 emission reductions (Unit: ton CO <sub>2</sub> )	Adopt clean and environmentally technologies and promote awareness to reduce environmental impacts
<input type="checkbox"/> SDG 10: Reduced Inequality		
<input type="checkbox"/> SDG 11: Sustainable Cities and Communities		
<input type="checkbox"/> SDG 12: Responsible Consumption and Production		
<input checked="" type="checkbox"/> SDG 13: Climate Action		
<input type="checkbox"/> SDG 14: Life Below Water		
<input type="checkbox"/> SDG 15: Life on Land		



Project Contributions to SDGs	Indicator (Please specify)	Description of Indicator
<input type="checkbox"/> SDG 16: Peace and Justice Strong Institutions		
<input checked="" type="checkbox"/> SDG 17: Partnerships to achieve the Goal	Last progress report submission date	Operational continuity of the JCM project, which mobilizes additional financial resources, disseminates low-carbon technologies, and reduces GHG emissions in Thailand

*\*Project Participant provides the description for each indicator of the selected SDGs and presents currently available datasets along with supporting documents.*

## 2.2 Details on Monitoring Parameters for Demonstrating SDG Contributions

*Provide details on how to monitor the indicators identified in Section 2.1.*

*(Tables can be added based on the number of selected SDGs.)*

SDG Number	7
SDG Target	Affordable and Clean Energy
Variable or Indicator	Amount of renewable energy generated electricity (Unit: MWh)
Duration/Frequency	Monthly
Method/Tool	Power Meter and Monitoring System
Responsible person	Staff of Impact Electrons Siam Co., Ltd. and/or Impact Solar Limited

SDG Number	9
SDG Target	Industry, Innovation and Infrastructure
Variable or Indicator	CO2 emission reductions (Unit: ton CO2)
Duration/Frequency	Monthly
Method/Tool	Calculation based on amount of generated renewable energy
Responsible person	Staff of Impact Electrons Siam Co., Ltd. and/or Impact Solar Limited

SDG Number	17
SDG Target	Partnerships to achieve the Goal
Variable or Indicator	Last annual progress report submission date (14-Jul-2025)
Duration/Frequency	Yearly
Method/Tool	-
Responsible person	Staff of Impact Electrons Siam Co., Ltd. and/or Impact Solar Limited

## Part 3 Do no net harm

### 3.1 'Do no net harm' Risk Assessment and Safeguards

*Specify impacts and mitigation plans to mitigate negative impacts.*

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
1. Impacts on Environment and Natural Resources						
1.1 Physical resources						
Water pollution	✓					
Soil pollution	✓					
Air pollution	✓					
Noise pollution	✓					
Odor pollution	✓					
Soil erosion, coastal/river erosion	✓					
Vulnerability to natural disaster	✓					
Other	✓					
1.2 Waste management						
Increase in solid waste/municipal solid waste	✓					

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
Increase in hazardous waste such as waste contaminated with oil, chemicals and used oil etc.	✓					
Increase in infectious waste	✓					
Increase in electronic waste		✓			Once the solar panels reach the end of their several-year lifespan (expected after the project concludes), proper disposal will be required.	Since solar PV modules might contain hazardous materials, it will be managed by licensed waste disposal operators for appropriate treatment and disposal which will follow the applicable Thai disposal regulations.
Other	✓					
<b>1.3 Biological resources</b>						
Impacts on forest areas and land-use change	✓					
Loss of land and wildlife ecosystem	✓					
Loss of water resources and aquatic ecosystem	✓					
Foraging	✓					

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
Food	✓					
Other	✓					
<b>1.4 Human livelihood</b>						
Water drainage or waterway diversion	✓					
Change in water consumption	✓					
Change in land ownership	✓					
Other	✓					
<b>2. Social impacts</b>						
Public security such as increase in crime risks	✓					
Health impacts	✓					
Relocation or temporary/permanent loss of land	✓					
Loss of housing	✓					
Impact on public utilities such as electricity, telephone service etc.	✓					
Impact on traffic	✓					

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
Community conflict	✓					
Employment and labor	✓					
Impact on people of certain race, religion and ethnic groups	✓					
Damage to areas of high conservation value, such as religious sites, historic sites, monuments, important places of the community etc.	✓					
Impact on human rights such as education, freedom of thought, religion etc.	✓					
Gender inequality such as in employment opportunities, salary, promotion, benefits, termination of contract etc.	✓					
Other	✓					
<b>3. Economic impacts</b>						

Potential Impact of Project Activity	Severity Level of Impact				Description of Impact	Action Plan to mitigate harmful impacts
	None	Low	Moderate	High		
Increase unemployment /loss of income of people in local communities	✓					
Other	✓					

*\*Criteria for assessing the level of impact severity*

1. None: The proposed activity has no direct/indirect impacts on the environment, society and economy.
2. Low: The proposed activity causes some changes to the existing conditions but has no implication on the quality of the environment, society and economy. The impact is short-lived and temporary, and the extent of the affected area is not large (1km perimeter).
3. Moderate: The proposed activity causes some changes to the existing conditions and has implications on values or qualities of the environment, society and economy. The impact is short-lived and temporary. The extent of the affected area is large but confined to the related area (2km perimeter).
4. High: The proposed activity causes some changes to the existing conditions and has implications on value or quality of the environment, society, economy, and potentially the ecosystem. The impact is permanent and the extent of the affected area id extensive (3km perimeter).

### 3.2 Details on Monitoring Parameters for Ensuring No Negative Impacts

*Provide details on how to monitor the impacts identified in Section 3.1.*

*(Tables can be added based on the number of negative impacts identified)*

<b>Category of negative impact</b>	Waste management
<b>Subcategory of negative impact</b>	Increase in electronic waste
<b>Vulnerable group</b>	People and the environment nearby solar PV module disposal sites
<b>Possible negative impact</b>	Improper disposal of solar PV modules carries the risk of environmental contamination and potential health hazards for proximate communities due to the leaching of harmful substances.
<b>Parameter/indicator</b>	Number of PV modules properly disposed
<b>Reference</b>	Relevant Thai regulations, including the Ministerial Regulation on Industrial Waste Management B.E. 2566 (2023)
<b>Duration/frequency</b>	Yearly
<b>Method/Tools</b>	Apply the method in accordance with Thai regulations at the time of disposal.
<b>Responsible person</b>	Licensed waste disposal operators/Staff of Impact Electrons Siam Co., Ltd. and/or Impact Solar Limited
<b>Expected outcome</b>	Solar PV modules containing hazardous materials are disposed of properly, thereby protecting the environment and people around the disposal site.