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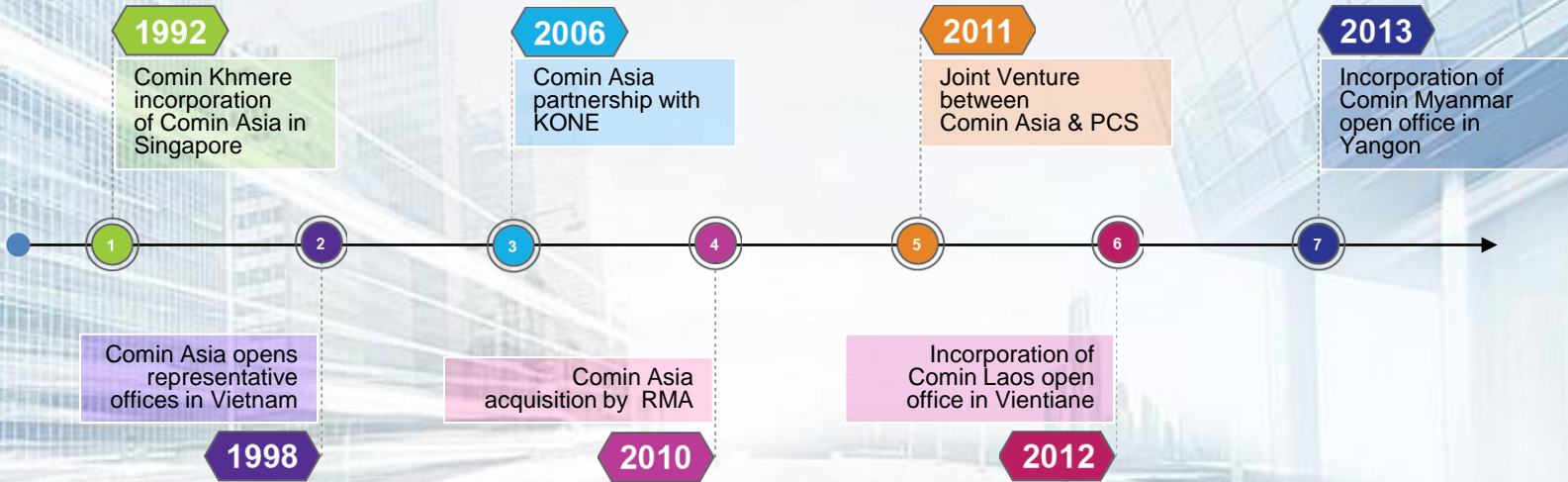
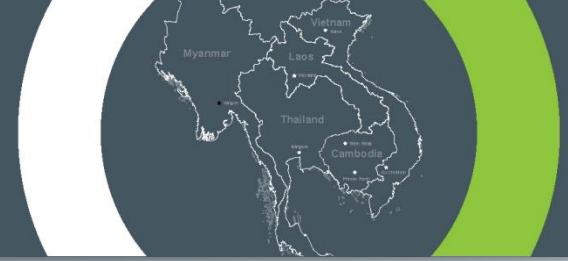
COMIN ASIA & Solar



RMA Global Reach



COMIN GROUP HISTORY



Over **2,000**
Employees



HEALTH, SAFETY AND ENVIRONMENT



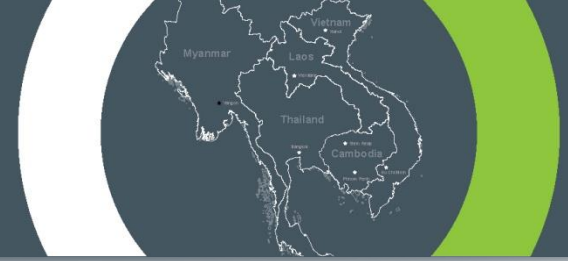
- ✓ **Comply with OHSAS 18001 System**
- ✓ **Safe working environment**
- ✓ **Efficient system of work, quality control and documentation**
- ✓ **Productivity & reduction of incidents**
- ✓ **Comply with local legal regulations**

ISO QUALITY MANAGEMENT



- ✓ **Comply with ISO 9001 System**
- ✓ **Monitor, manage & improve quality across all operations**
- ✓ **Consistent performance & service**
- ✓ **Efficient internal work process**
- ✓ **Better customer service**

EXPERTISE



Supply & Procurement

Design

Installation

Testing & Commissioning

Maintenance



Trading Division



Contracting Division



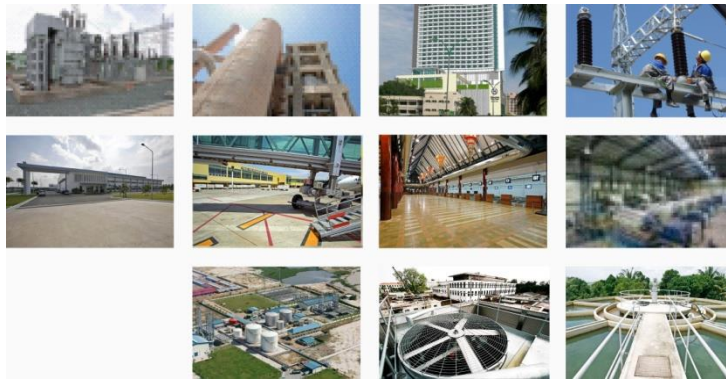
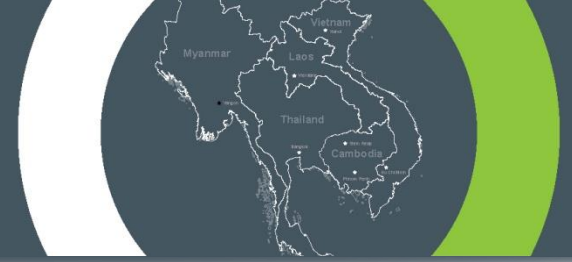
Power T&D Division



Service Division

EXPERTISE





Project References



Industrial



Coca-Cola Pinya Beverages (Myanmar)

Honeys Garment Factory (Myanmar)

Kianjoo CAN Factory (Myanmar)

Kianjoo Box Pak factory (Myanmar)

PEB Steel Factory (Myanmar)

Coca-Cola Laos (Laos)

Mascot (Laos)

Cambodia Beverage Company (Cambodia)

Crown Can Factory (Cambodia)

Sihanoukville Economic Zone (Cambodia)

Ojitex (Cambodia)

Crown (Cambodia)

Mindebea Factory (Cambodia)

Commercial Buildings



ACLEDA Bank (Cambodia)

Sathapana Bank (Cambodia)

Vattanac Capital Project (Cambodia)

Bred Bank (Cambodia)

Y Chhe Office Building (Cambodia)

Lyzones Tower C (Cambodia)

Diamond Twin Tower (Cambodia)

TK Royal One (Cambodia)

World Bank (Lao)

BFL Bank (Laos)



Solar Projects



Client	Location	Type	Scope of work	Year	Capacity
Bolloré	Siem Reap	Ground mounted Grid-tied	EPC	2013	70 kWp
PSE	Phnom Penh	Rooftop grid-tied	EPC	2013	35 kWp
Laurelton	Phnom Penh	Ground mounted grid-tied, parking roof	EPC	2014	143 kWp
Phnom Penh Special Economic Zone	Phnom Penh	Ground mounted Grid-tied	EPC	2016	126 kWp
Pactics factory	Siem Reap	Ground mounted Grid-tied	EPC	2015	30 kWp
Ecole Paul Dubrule	Siem Reap	Ground mounted Grid-tied	EPC	2012	17 kWp
Knay Bang Chhat	Kep	Rooftop grid-tied	EPC	2017	17 kWp
Coca Cola	Phnom Penh	Rooftop grid-tied	EPC	2016	2.6 MWp
Angkor Dairy	Phnom Penh	Rooftop grid-tied	EPC	2017	466 kWp
ISI steel factory	Phnom Penh	Rooftop grid-tied	EPC	2017	1 MWp
Sheico	Phnom Penh	Rooftop grid-tied	EPC	2017	858 kWp
International School of Phnom Penh	Phnom Penh	Rooftop grid-tied	EPC	2017	800 kWp
US Embassy	Phnom Penh	Rooftop grid-tied	EPC	2017	300 kWp
PSE	Phnom Penh	Rooftop grid-tied	EPC	2018	30 kWp
Horseware products	Sihanoukville	Rooftop grid-tied	Design	2018	125 kWp
Total – Gas stations phase 1	Phnom Penh	Rooftop grid-tied	EPC	2018	233 kWp
Total – Gas stations phase 2	Cambodia	Rooftop grid-tied	Design	2018	120 kWp
United Nations Development Program building	Phnom Penh	Rooftop grid-tied	EPC	2018	26 kWp
GMAC office	Phnom Penh	Flat roof grid-tied	EPC	2018	53 kWp
Chip Mong Insee Cement	Cambodia	Rooftop grid-tied Floating	EPC	2018	10 MWp
Factory (in progress)	Cambodia	Rooftop grid-tied	EPC	2018	500 kWp
Factory (in progress)	Cambodia	Rooftop grid-tied	EPC	2019	3.1 MWp
Total					20.7 MWp

Renewable Energy



Chip Mong Insee (Cambodia)
Coca Cola (Cambodia)
Angkor Dairy (Cambodia)
ISI (Cambodia)
ISPP (Cambodia)

Solar Regulation



- If own transformer +250kW can install Solar
- Need to request to EDC,
- After letter of no objection 1 year to install the system
- Before commissioning EDC check if build according to as built drawings
- 2 weeks later EDC team to witness commissioning, check anti islanding and zero export
- Can only install 50% AC output of capacity charge

Example KC office

- If 250kW transformer
- If Load is max 120kW
- Solar system can be 100kw DC=80kW AC
- Capacity charge 160kw.

Normal and Solar Tariff



4. Industrial and Agricultural Consumers Connecting to MV Distribution Line <ul style="list-style-type: none"> • Average Rate Billing Option • Time and Power Capacity Billing Option <ul style="list-style-type: none"> - Maximum Power Capacity Rate - Peak Load Time Rate (7am – 9pm) - Low Load Time Rate (9pm – 7am) • For Consumers with PV System <ul style="list-style-type: none"> - Maximum Power Capacity Rate - Electricity Rate (24h) 	\$/kWh \$/kW/month \$/kWh \$/kWh \$/kW/month \$/kWh	0.1370 5.00 0.1300 0.1100 5.00 0.1300
5. Commercial, Administration and Other Consumers Connecting to MV Distribution Line <ul style="list-style-type: none"> • Average Rate Billing Option • Time and Power Capacity Billing Option <ul style="list-style-type: none"> - Maximum Power Capacity Rate - Peak Load Time Rate (7am – 9pm) - Low Load Time Rate (9pm – 7am) • For Consumers with PV System <ul style="list-style-type: none"> - Maximum Power Capacity Rate - Electricity Rate (24h) 	\$/kWh \$/kW/month \$/kWh \$/kWh \$/kW/month \$/kWh	0.1580 5.80 0.1500 0.1240 5.80 0.1500

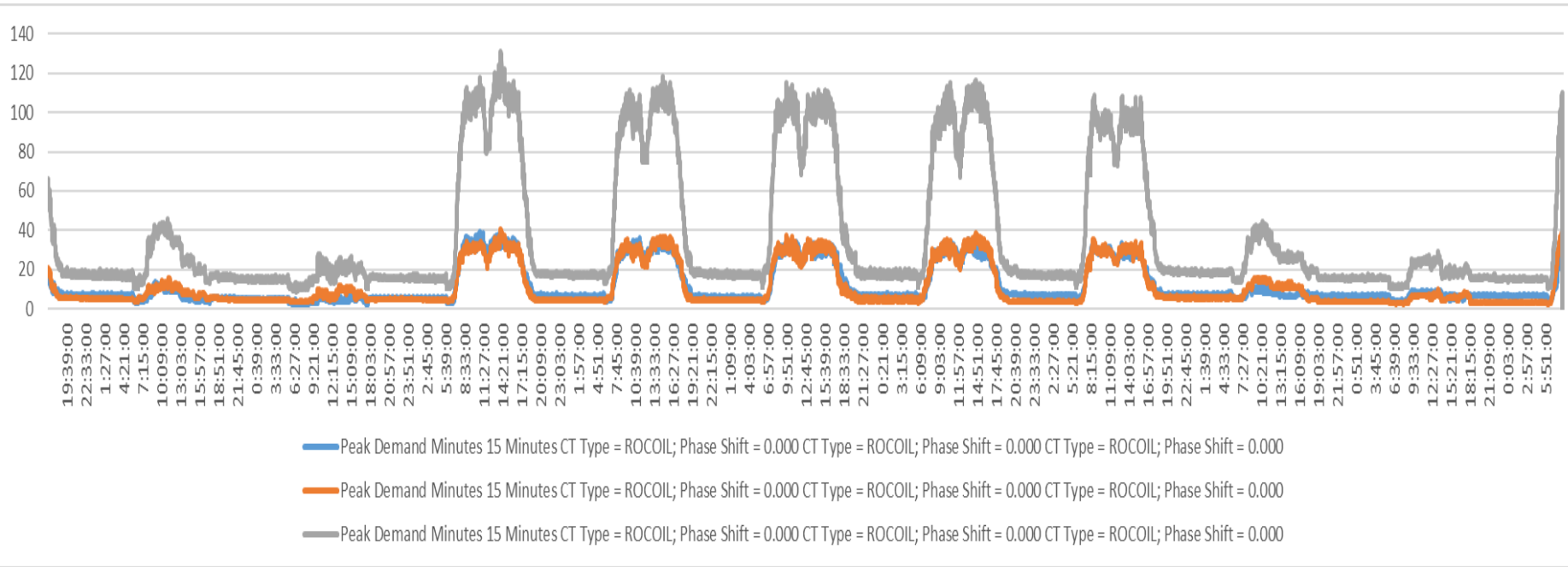
Example 100kW Solar system CK office



Facts and Figures

- Monthly consumption about 30,000kWh
- Maximum load about 130 kW

ប្រវត្តិប្រើប្រាស់ថាមពល១២ខែចុងក្រោយ				ប្រសិនបើអ្នកប្រើប្រាស់ ទំនាក់ទំនងដោយផ្ទាល់ជាមួយ អគ្គិសនីកម្ពុជាក្រុងភ្នំពេញ សារព័ត៌មានសង្គមជាលក្ខណៈ ខុសត្រូវដែលប៉ះពាល់ដល់ ច្បាប់ពាក់ព័ន្ធជាជាធរមាន
25/12/17	26614kWh	26/01/18	24165kWh	
24/02/18	25672kWh	25/03/18	26869kWh	
25/04/18	28575kWh	26/05/18	28772kWh	
25/06/18	30064kWh	24/07/18	30271kWh	
25/08/18	30816kWh	26/09/18	33941kWh	
26/10/18	26142kWh	25/11/18	28493kWh	



Solar Generation



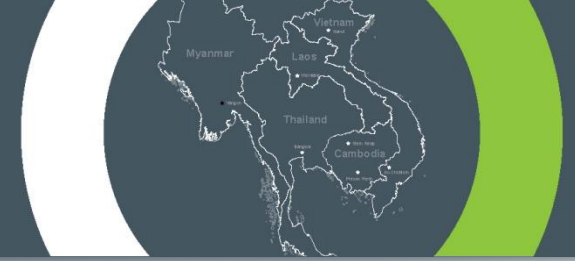
Facts and Figures

- Solar generation about 11,000kWh/month, 132,000kWh/year
- Savings about \$1500 per month or 22,200 per year
- Investment \$90,000
- Simple ROI 4 years

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	\$ 5,298	\$ 5,567	\$ 5,256	\$ 5,083	\$ 6,093	\$ 5,974	\$ 5,974	\$ 5,558	\$ 5,524	\$ 4,808	\$ 4,974	\$ 4,384
2020	\$ 5,269	\$ 5,411	\$ 3,861	\$ 4,047	\$ 4,102	\$ 4,343	\$ 3,987					
Reduction	\$ 29	\$ 155	\$ 1,395	\$ 1,035	\$ 1,992	\$ 1,631	\$ 1,987					

	Mar	Apr	May	Jun	Jul
Solar generation in kWh	7,770	11,370	11,940	12,760	10,070
Savings based on 18 cents	\$ 1,399	\$ 2,047	\$ 2,149	\$ 2,297	\$ 1,813

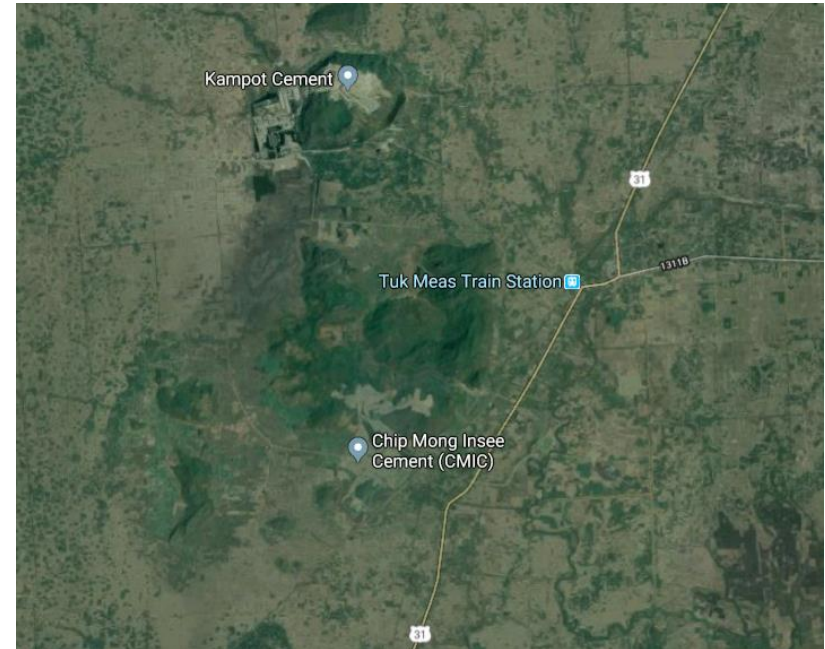
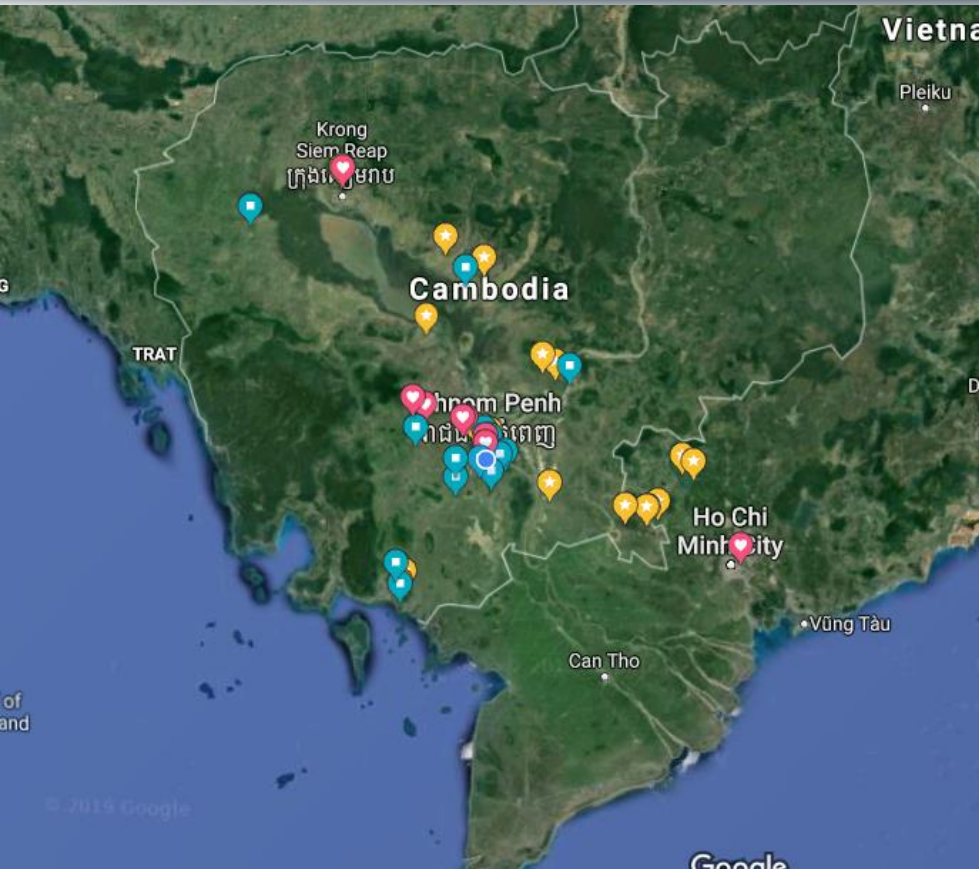
CASE STUDY:



Chipmong Insee Cement Factory, 9.8 MW Solar



Location



Touk Meas, Kampot, Cambodia

<https://goo.gl/maps/ua5UgUFPLN6fSfvy9>



Location



Location



March 2017 1st visit with Cleantech



Facts and Figures

- Established 2015, first production 2017
- US\$ 263 million greenfield
- Daily production of 5,000 tons
- Electricity consumption of about 26MW 24/7
- Heat recovery plant of 7 MW
- Solar Power plant of 9.8MW



SOLAR PROJECT DEVELOPMENT



Success factors:

- (Comin Khmère) CK relation with the Chipmong CEO
- CK experience with Coca Cola 2.5MW Solar installation with PPA with Cleantech;
- CK general MEP track record, ISO/Safety standards;
- Cleantech interest to extend business in Cambodia
- Opportunity to save cost and get a positive image
- Sufficient area for solar both roof and pond
- Regulation in favor of factories running 24/7

Solar Design



Total kWpeak installed	9,834.14	kWpeak
Surface Panels	58,602	m2
Total surface required	7.01	ha
Roofs	4.74	ha
Pond	2.28	ha
Expected yearly generation	12,784,381	kWh/year
	12,784	MWh/year
Tonne CO2 saved	9,205	t/CO2/year

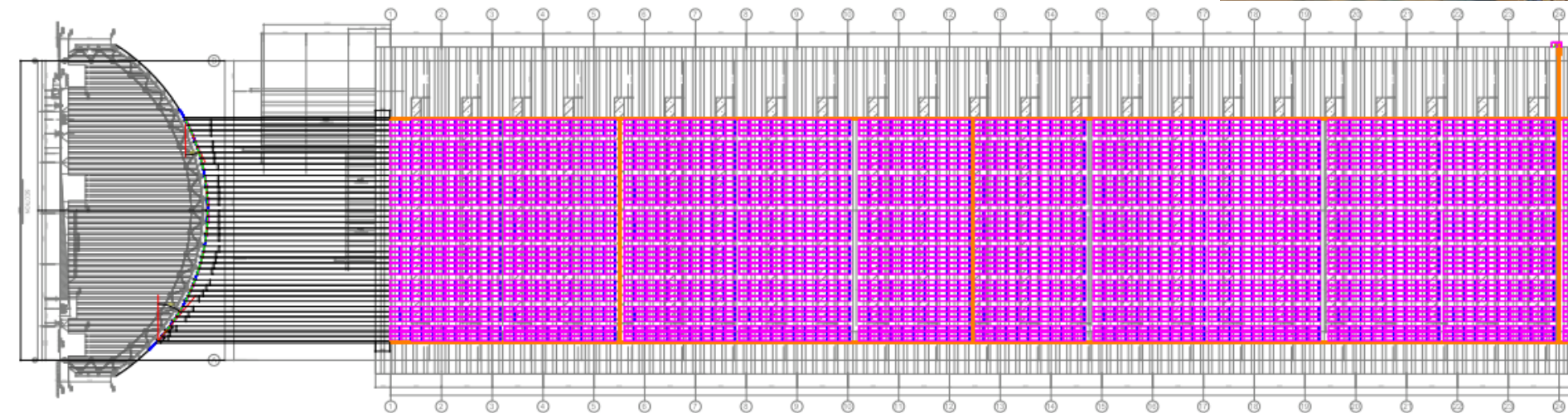
	Panels	kW panel	kWp	Total surface
Roof 1	2,618	325	850.85	5,760
Roof 2	4,305	325	1,399.13	9,471
Roof 3	8,190	325	2,661.75	18,018
Roof 4	594	326	193.64	1,307
Roof 5	768	325	249.60	1,690
Roof 6	558	325	181.35	1,228
Roof 9	200	325	65.00	440
Roof 11	4,300	325	1,397.50	9,460
Pond	7,768	365	2,835.32	22,683
Total	29,301		9,834.14	70,055



Solar Design



Challenge of Curved Roof



PREMIXED MAT. STORAGE HALL.

TOTAL - 8000 SQUARE

Challenge of Curved Roof



Challenge of Curved Roof



Challenge First Floating System



Link to Video



Discussion



- Solar Regulation ok for day-time consumers like garment factories
- For industries running 24/7 with stable load solar will not result in savings
- Need to reduce capacity charge to maximum load.



THANK YOU

