SMART Myanmar

switchasia

Funded by the European Union

Sustainable consumption & production in Myanmar's garment industry

Observations from SMART Myanmar

Project funded by the European Union.

Co-funded by the German Federal Ministry for Economic Cooperation and Development

german cooperation

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Implemented by the SMART Myanmar 2.0 partner consortium:

Partners: sequa gGmbH, MGMA, AVE and ADFIAP

Associates: *CBI, GIZ, Lindex & H&M*

sequa gGmbH
Partner of German Business

MGMA

AVE
Foreign Trade Association of German Retailers

ADFIAP
financing sustainable development

LINDEX

H&M

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

CBI
Ministry of Foreign Affairs of the Netherlands

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SMART major project activities

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- **Factory improvement programs - the major element of SMART**
- **Green finance - support for banks and advocacy for green finance for SMEs**
- **Development of smartphone apps to educate workers on labour laws**
- **Implementation of community centers for women garment workers**
- **Facilitation of public-private dialogue on social & environmental topics**

SMART major project activities

SMART is a capacity building project focused on the Myanmar garment industry.

January Jan. 2013 – Dec. 2019 (two project phases)

Aim is to improve **social + environmental** conditions at over **200** factories via on-site assessments and capacity building. Thousands of managers staff and workers from 230 factories have joined workshops, events or on-site programs with SMART.

On-site factory programs include:

SMART Management Systems Program

SMART Environmental Management Program

SCORE Program

Data/observations - how SMART collects information

Main distribution board

Sewing machine & motors

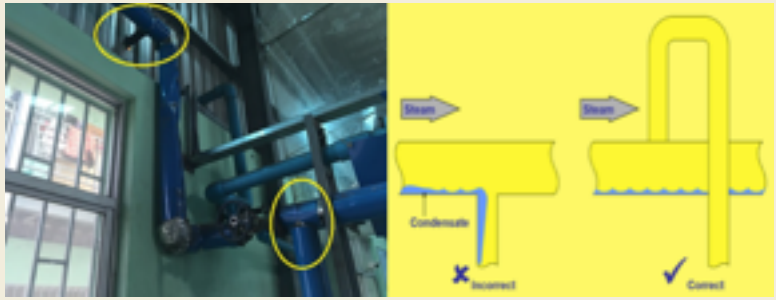
Water pumps

Waste mgt. practices

Boilers

Air compressors

Steam systems



Wastewater & chemical mgt. practices

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Examples of techniques

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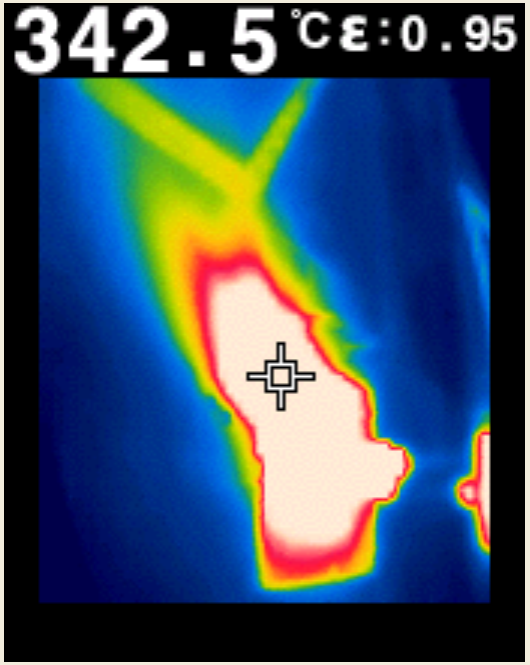
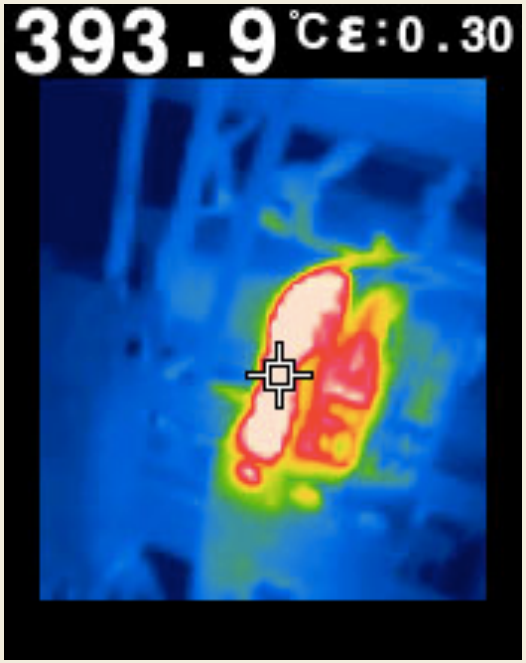
THERMAL IMAGING

Steam piping network at factory C



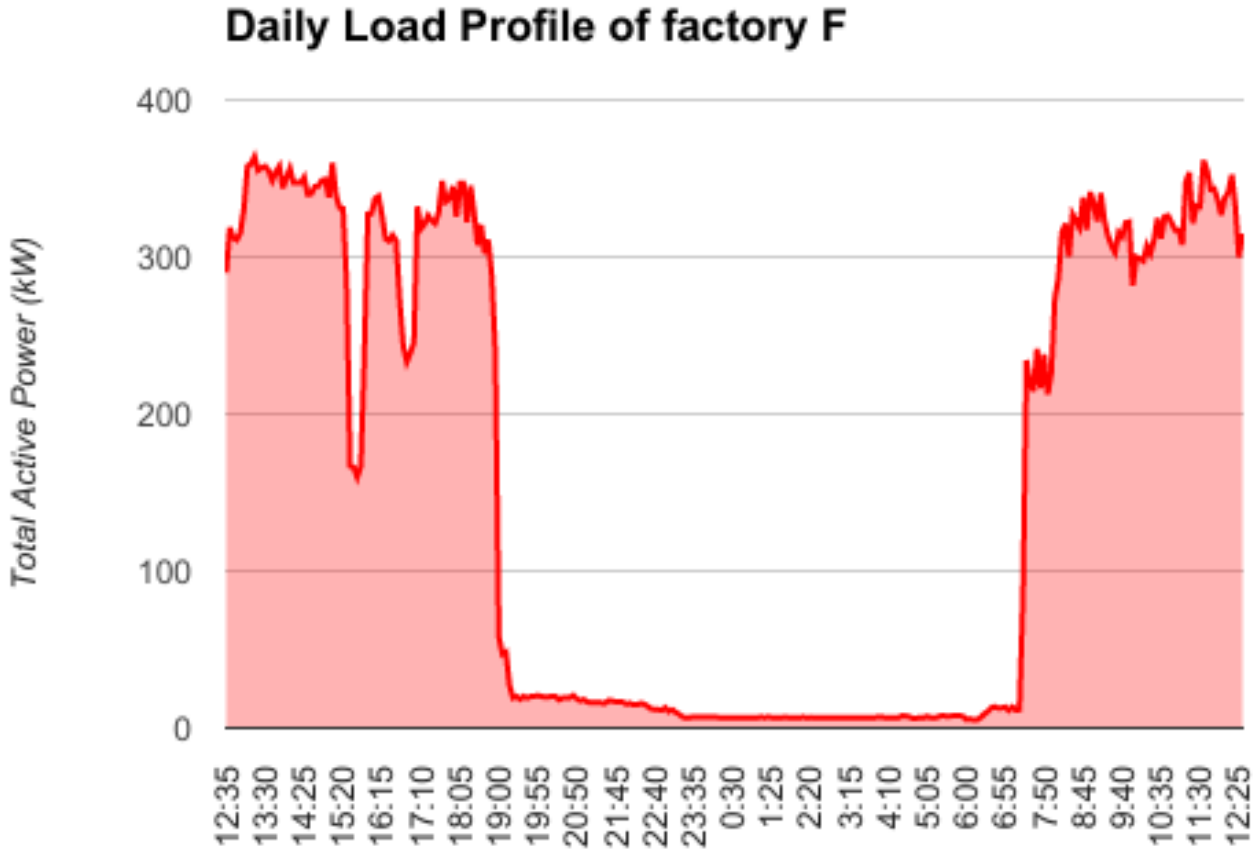
Flame control window on gas boiler in factory G



Immensely dangerous and overloaded circuits in factory E.

Examples of techniques

ELECTRICITY LOGGING/MONITORING



Electricity data logger and its clamp current transformers

Examples of techniques

STEAM SYSTEM ANALYSIS

Condensates drain releasing too much steam

Operation of steam trap replacement at factory J

New steam trap

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Examples of activities

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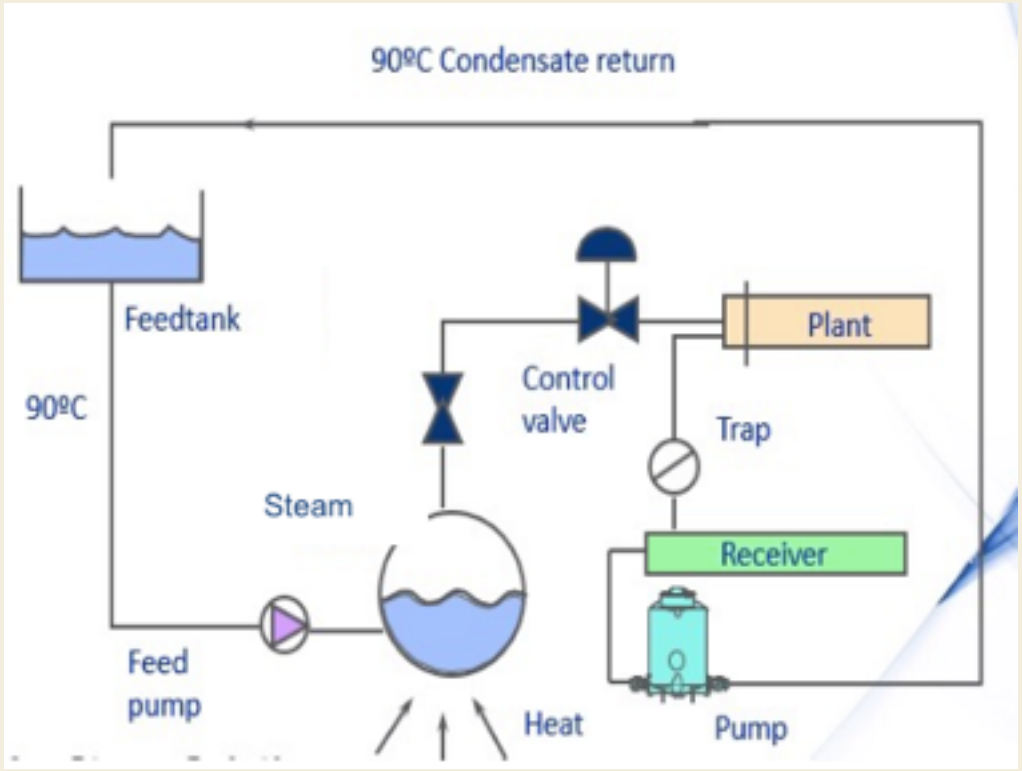
STEAM CONDENSATE RECOVERY*



Proper system schematic. Great potential energy savings for many factories.

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Chemical management overview

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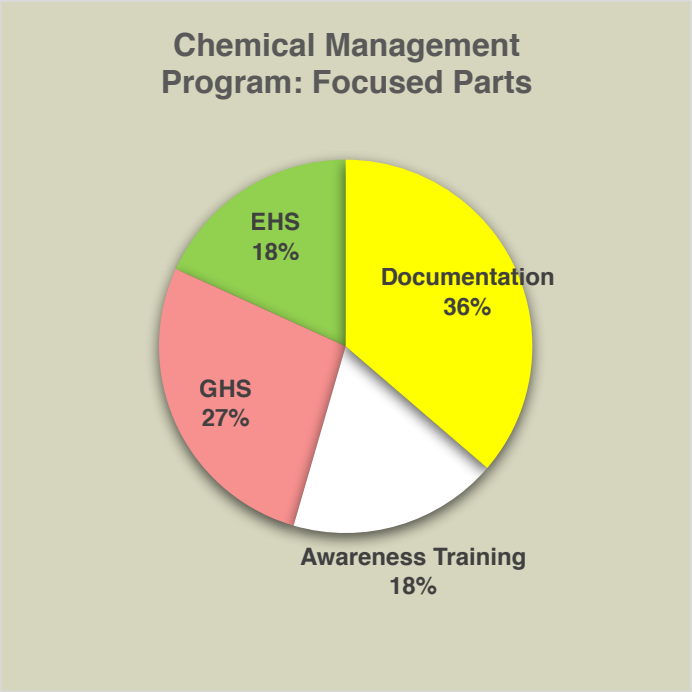
- **Chemical Management System**
  - ✓ GHS Safety Data Sheet, Classification & Labelling
  - ✓ Chemical & Processes of Concerns (NPOs)
  - ✓ Chemical Inventory
  - ✓ Chemical Hazards & Exposure
- **Change and Risk Management of Chemicals**
  - ✓ Risk Assessment
  - ✓ Chemical Storage & Transportation
  - ✓ Chemical Emergency Management



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Chemical management

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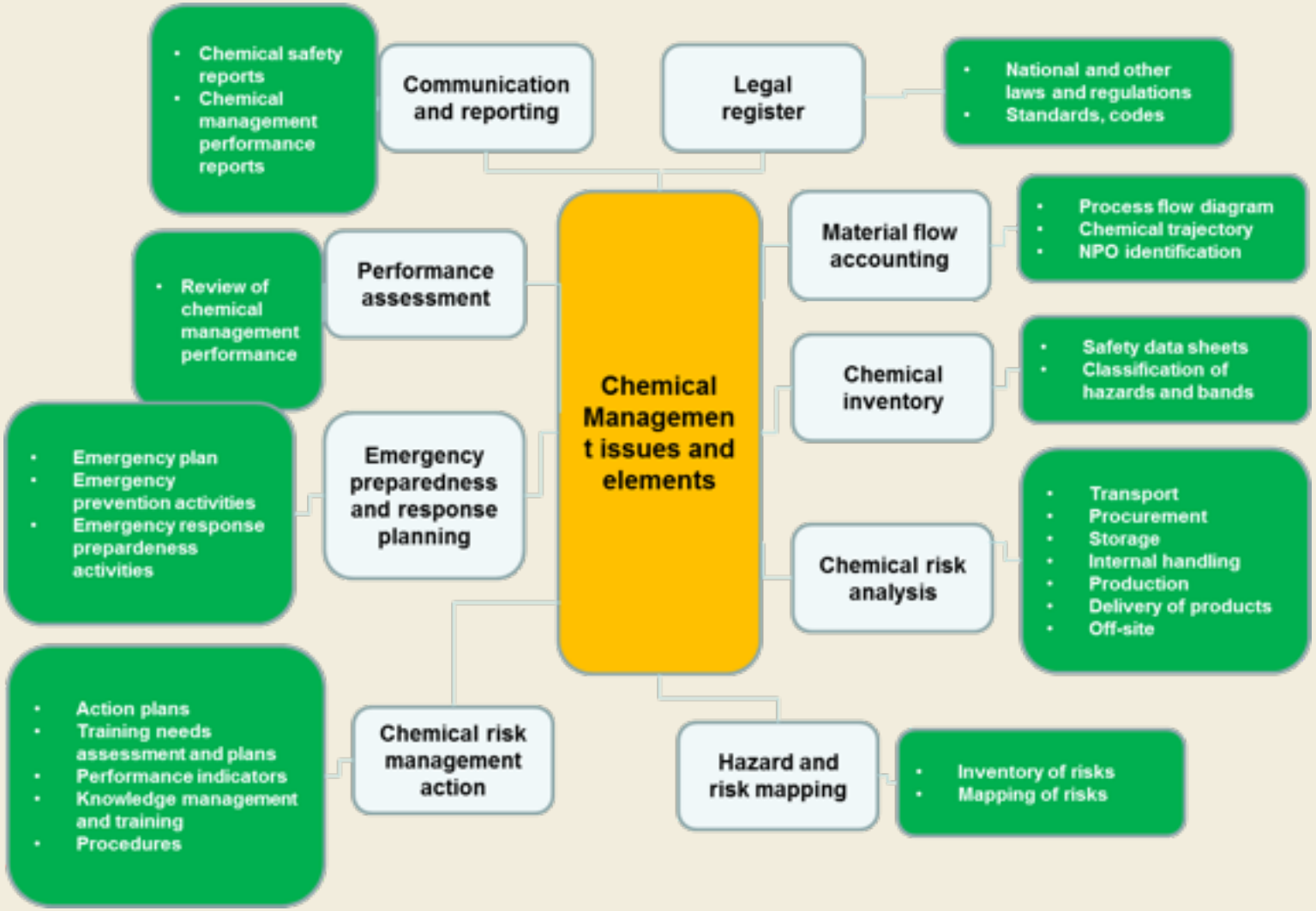

Selected characteristics of factories assessed by SMART…

	Facility size in sq. meters	*Electric bill, million kyats/yr*	*Total of other fuel million kyats/yr*	*Other fuels used*
A	***14,892***	***152***	***72.3***	***fabric scraps, wood, diesel***
B	***36,000***	***191***	***23.1***	***natural gas, diesel***
C	***3,200***	***18.5***	***1.8***	***diesel***
D	***5,375***	***33***	***30.7***	***diesel, coal***
E	***10,800***	***10.5***	***101***	***diesel, wood***
F	***7,872***	***144***	***117***	***diesel***
G	***40,000++***	***661.4***	***220***	***natural gas***
H	***2,290***	***44.3***	***5.3***	***diesel, natural gas***
I	***732***	***3***	***7.85***	***diesel***
J	***4,500***	***32.1***	***1.17***	***diesel***

	Facility size in sq. meters	*Electric bill (EPC) million kyats/yr*	*Total of other fuels, million kyats/yr*	*Other fuels used*
H	***6,368***	***83***	***120***	***diesel, natural gas***
I	***3,020***	***54.3***	***6.8***	***diesel***
J	***14,284***	***0 (no grid connection)***	***540***	***coal, diesel***
K	***39,600***	***240***	***53.5***	***coal, diesel***
L	***7,078***	***42.7***	***98.8***	***coal, diesel***
M	***5,000***	***60***	***66***	***diesel, wood***
N	***21,805***	***278.9***	***111.7***	***diesel, wood***
O	***10,379***	***67.4***	***107***	***diesel***
P	***23,243 (2 sites)***	***195***	***271***	***diesel, wood, coal***
Q	***12,442***	***212.1***	***not available***	***diesel, wood***

SMART Energy Efficiency Program

	Facility size in sq. meters	*Electric bill (EPC) million kyats/yr*	*Total of other fuels, million kyats/yr*	*Other fuels used*
R	***6,000***	***58.8***	***37***	***diesel, coal***
S	***1,620***	***11***	***approx. 2.5*** *(partial record)*	***diesel, wood***
T	***14,000***	***73***	***6***	***diesel***
U	***7,000***	***54.7***	***38***	***diesel***
V	***2,000***	***11.3***	***1.2***	***diesel***
W	***n/a***	***43.5***	***3.4***	***diesel***
X	***n/a***	***133.5***	***86***	***diesel***
Y	***n/a***	***n/a***	***n/a***	***diesel, rice husk pellet***

7 Topics of High Concern

1) Air pollution/emissions - from boilers and generators, especially coal-fired boilers, wood-fired boilers and the burning of waste.

2) Deforestation - wood fired boilers often require extremely large volumes of wood.

3) Over-extraction of water - especially textile processing and garment washing facilities require an immensely high volume of water.

Some key environmental concerns

4) Water pollution - rivers & watersheds polluted by dyeing & washing facilities if wastewater inadequately treated.

5) Energy (in)efficiency - Huge waste of energy at all factories (even the newest factories). Easy wins possible.

6) Hazardous waste - factories can sometimes generate various types of hazardous & toxic waste which should be specially cared for.

7) Solid waste - large volumes of fabric scraps, rubber & foam cuttings, paper and plastics are generated during the production process.

Factory characteristics: *energy*

Observations on energy:

- Newer & larger factories can have large energy consumption needs. As such, efficiency is especially relevant for them; 20% reduction in energy at factory N could equal about 120,000 kg of coal per year reduced.
- Boilers: too much wood fuel use; too much coal use - high carbon emissions, sulfur dioxide, heavy metals & other environmental concerns + PM2.5 particulates & contribution to air pollution and deforestation at alarming rates.
- Five factories in garment now with solar systems but cannot sell back to the grid on Sundays, so capacity is wasted.
- Capacitor banks/power factor not effectively regulated.
- Policies on peak load management, incentives for energy efficient equipment and renewables are lacking.

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Skylights…

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Natural light is still far under-utilized. Below are two garment factories, one in Yangon and one in Pathein who make great use of skylights.

Solar in Myanmar

Total rooftop solar PV in the MM garment industry reached ~500 kW peak generation capacity by June, 2019.

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Solar in Myanmar

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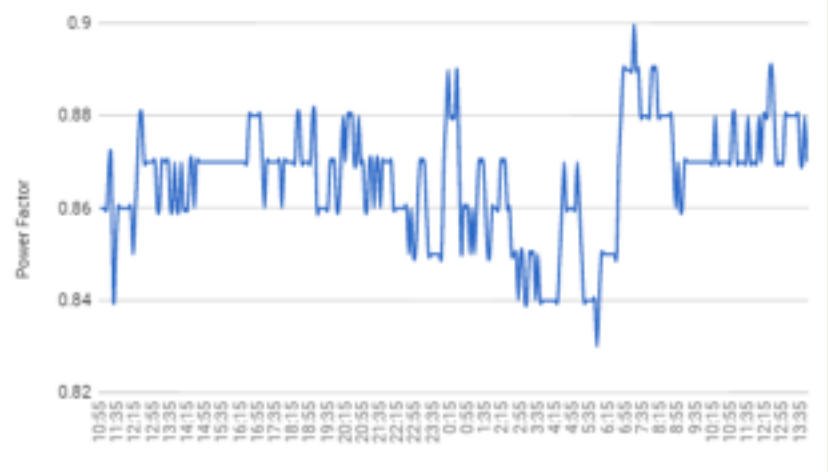
Why is solar perfect for the MM garment industry?

- Myanmar receives an immense amount of sunshine.
- Sunshine peaks during the dry season, when power outages are most frequent due to reduced hydro capacities and increased air conditioning use. So, solar substitutes more often for diesel generator back-up.
- Garment factories can have extremely large roof space.
- Solar panels have been demonstrated to reduce heat gain in steal frame structures (act as insulation where installed)
- If (when) the MM government changes policies on feed-in tariffs, garment factories will be able to sell solar electricity to the grid on off days.

Power factor sub-optimal in most factories

- **Observation:** avg. power factor far below optimal (less than 0.95)
- **Result:** Significant unnecessary losses due to a lower quality of electricity utilization.
- **Potential:** It may be possible to reduce power consumption in Myanmar's industrial zones by up to 3-5% simply by better educating & regulating capacitor bank usage.



Factory characteristics: *waste*

Selected characteristics of 30 factories in SMART's Academy & SCORE programs					
Fty.	*Facility size employee number*	*Who collects solid waste?*	*Payment received for selling waste?*	*Does factory burn any waste?*	*Most common types of waste*
1	*900*	*PCCD + 3rd party*	*Yes*	*No*	*fabric scraps, plastics, paper*
2	*600*	*PCCD +3rd party*	*Yes*	*No*	*fabric scraps, plastics, paper*
3	*280*	*no one*	*No*	*Yes (boiler)*	*fabric scraps, plastics, paper*
4	*2,000*	*PCCD + 3rd party*	*Yes*	*Yes (boiler)*	*fabric scraps, plastics, paper*
5	*700*	*PCCD + 3rd party*	*Yes*	*No*	*fabric scraps, plastics, paper*
6	*2,600*	*PCCD + 3rd party*	*Yes*	*Yes (boiler)*	*fabric scraps, plastics, paper*
7	*330*	*no one*	*No*	*No*	*fabric scraps, plastics, paper*
8	*600*	*PCCD + 3rd party*	*Yes*	*No*	*fabric scraps, plastics, paper*
9	*1,000*	*PCCD + 3rd party*	*Yes*	*No*	*fabric scraps, plastics, paper*
10	*1,700*	*PCCD + 3rd party*	*Yes*	*No*	*fabric scraps, plastics, paper*
11	*100*	*no one*	*No*	*No*	*fabric scraps, plastics, paper*
12	*300*	*no one*	*No*	*No*	*fabric scraps, plastics, paper*
13	*100*	*no one*	*No*	*No*	*fabric scraps, plastics, paper*
14	*150*	*PCCD + 3rd party*	*Yes*	*No*	*fabric scraps, plastics, paper*
15	*130*	*no one*	*No*	*No*	*fabric scraps, plastics, paper*

Factory characteristics: *waste*

Selected characteristics of 29 factories in SMART's Academy & SCORE programs					
Fty.	*Facility size employees*	*Who collects solid waste?*	*Payment received for selling waste?*	*Does factory burn waste?*	*Fee to PCCD for waste collection?*
16	*200*	*no one*	*Yes, amount not disclosed*	*no*	*No*
17	*2,200*	*PCCD + third party*	*No*	*no*	*Yes*
18	*100*	*no one*	*Yes, amount not disclosed*	*no*	*No*
19	*150*	*third party only*	*Yes, amount not disclosed*	*no*	*No*
20	*3,000*	*PCCD*	*No*	*no*	*Yes, n/a*
21	*400*	*third party*	*Yes, amount not disclosed*	*no*	*No*
22	*1,000*	*PCCD*		*no*	*Yes*
23	*1,000*	*PCCD + third party*	*Yes, amount not disclosed*	*no*	*Yes, avg. 103,000 MMK/mnth*
24	*800*	*third party*	*Yes, 100,000 MMK/mnth*	*no*	*no*
25	*1,100*	*PCCD*	*Yes, 50,000 MMK/mnth*	*no*	*Yes*
26	*800*	*PCCD*	*No, scraps burned.*	*yes (boiler)*	*Yes, avg. 36,000 MMK/mnth*
27	*600*	*PCCD & third party*	*Yes, amount not disclosed*	*no*	*No*
28	*300*	*third party*	*Yes, amount not disclosed.*	*no*	*no*
29	*350*	*PCCD*	*Yes, 60,000 MMK/mnth*	*no*	*Yes*
30	*2,200*	*PCCD + third party*	*Yes, est. <500,000/month*	*no*	*Yes*

Waste disposal in industrial zones

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Summery of observations

- Often no regular waste collection service in industrial zones
- **High potential for illegal dumping** - especially by small factories or by 3rd parties. Some wastes are valuable due to recycling potential, some are not.
- Practice of burning wastes is too common; 13% of 30 factories surveyed. Burning plastics, polyesters, etc. releases **extremely toxic** dioxins and furans.
- Hazardous waste disposal is severely inadequate. Very few factories understand how to dispose of hazardous waste and services in this regard are lacking. Hazardous waste often mixed with regular waste.
- Seemingly little service provision for disposal of consumer/citizen waste in industrial zones, especially waste from squatter settlements is a big and growing problem.

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In conclusion…

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To sum up the key points:

- **Effective measuring and monitoring of electricity, water and waste consumption are critically important.**
- **Industrial scale is growing rapidly. So, too, pollution problems.**
- **Good practices (solar, energy efficient boilers, recycling) should be incentivized and rewarded.**

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In conclusion…

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To sum up the key points…

- **Considering changes/impacts in the industry, we ought to consider - - where do environmental management plans (EMPs) fit into the picture? Are these documents guiding factories effectively on KPIs for energy, water and waste reduction? Are they focused on the most important issues? Are they practical and usable documents? Is the purpose of an EMP to reduce environmental impact?**

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SMART Myanmar is funded by the European Union and co-funded by the German Federal Ministry for Economic Cooperation and Development.

Learn more at: www.smartmyanmar.org

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