Road Towards A Sustainable Solar Industry In MENA

A Case Study; Concentrated Solar Power in Morocco

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ACWA Power - Snapshot



- Founded in 2004 in the Kingdom of Saudi Arabia with a vision to become an international utility company that **<u>reliably delivers</u>** bulk electricity and desalinated water at the **<u>lowest possible tariff</u>**.

- **<u>Technology agnostic</u>**; developer, owner and operator

- Assets Portfolio:
  - ✓ In operation: 7,500 MW & 2.24 m^3 / day desalinated water
  - ✓ Under construction: 5,200 MW

  - ✓ Saudi Arabia 11% of Electricity + 40% of Desalinated Water
  - ✓ Oman 12% of Electricity + 17% of Desalinated water
  - ✓ Jordan 59% of Jordan's Electricity

- **Internal target for renewables = 5% of portfolio by 2014 = 1,500 MW**

- Experience in renewables (amongst others):
  - Tendering Ouarzazate CSP, 160 MWe in Morocco
  - Tendering 50 MWe in South Africa (REFIT round 2)
  - Under developement10 MWp PV plat in Jordan
  - In operation wind assets in Jordan
  - Under development Saudi renewable projects

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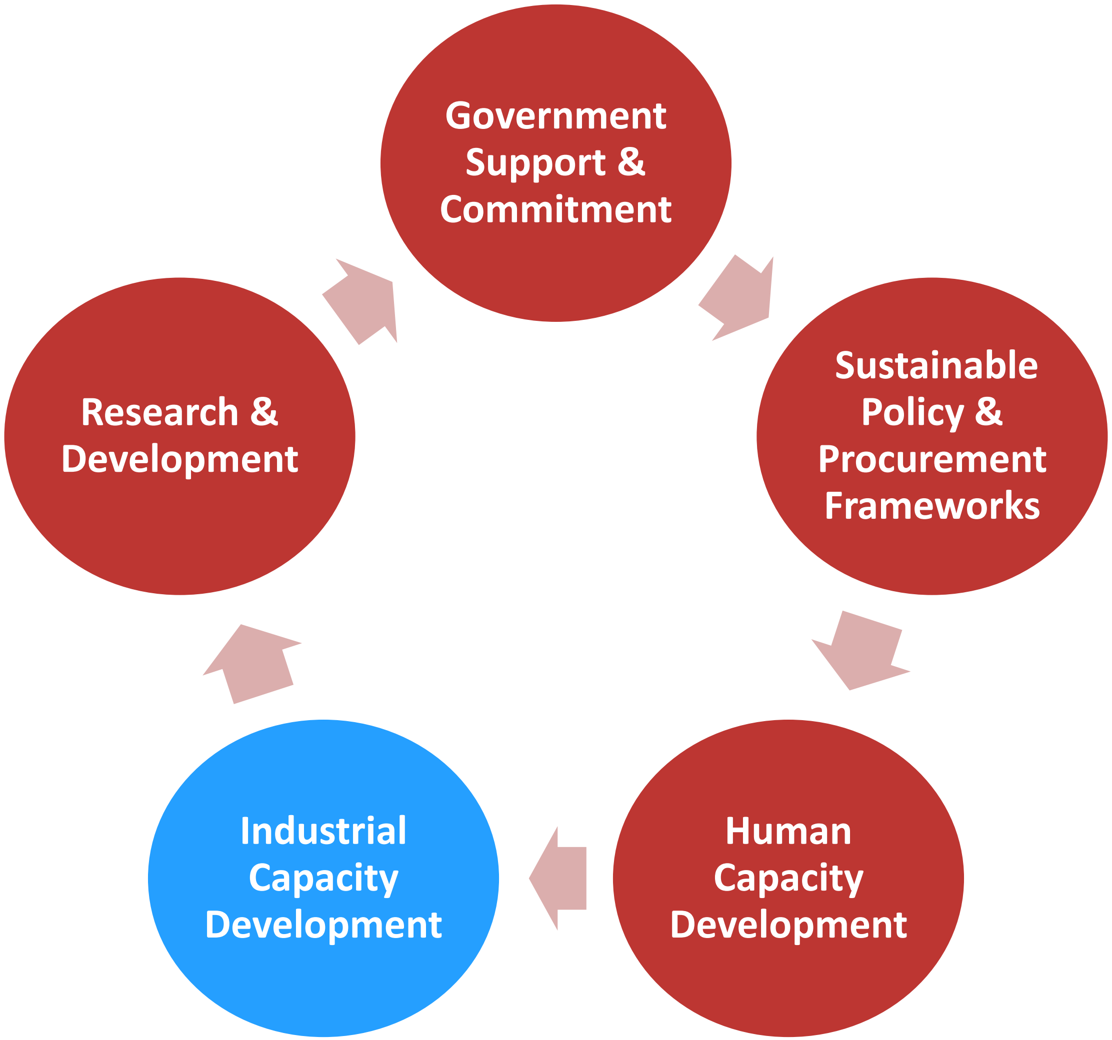
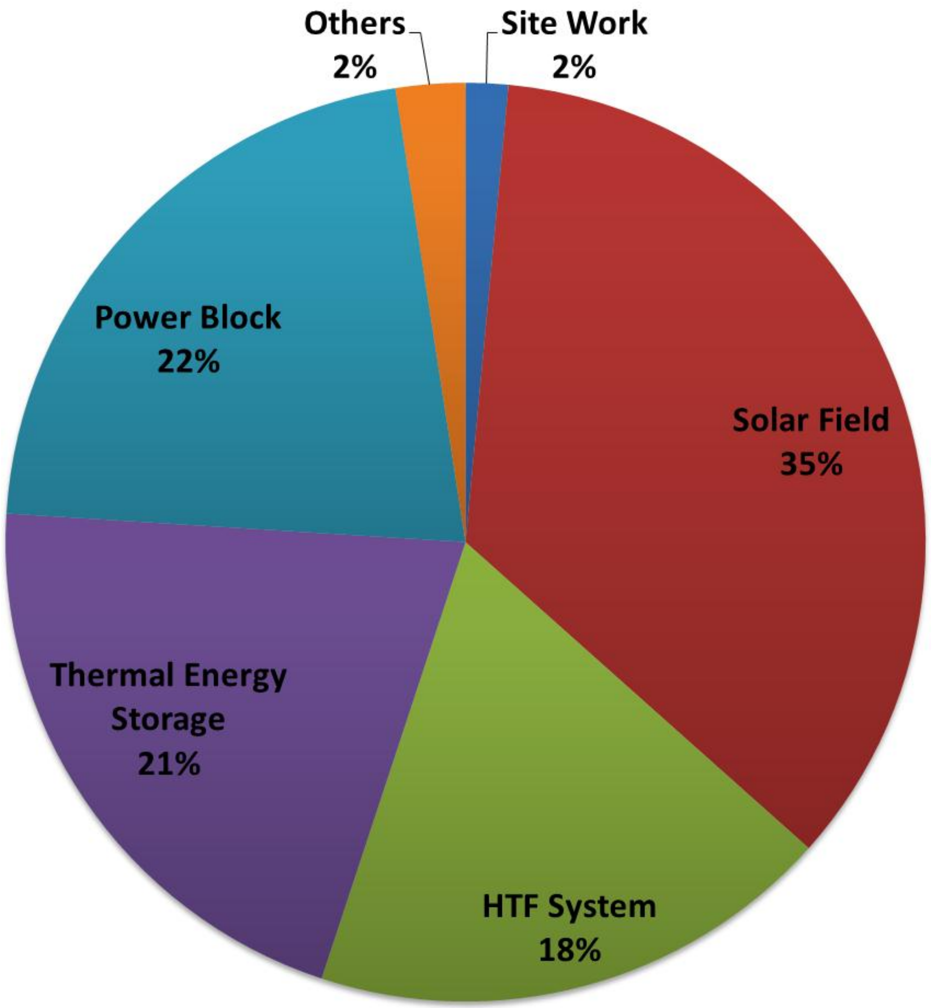
Drivers For Developing A Sustainable Solar Industry



CSP Plant Cost Breakdown (Case For Morocco)



Potential For Local Procurement:

- ✓ Site Work ~ 100%
- ✓ **Solar Field ~ 40%**
- ✓ Power Block ~ 25%
- ✓ HTF System ~ 20%
- ✓ Thermal Energy Storage ~ 20%

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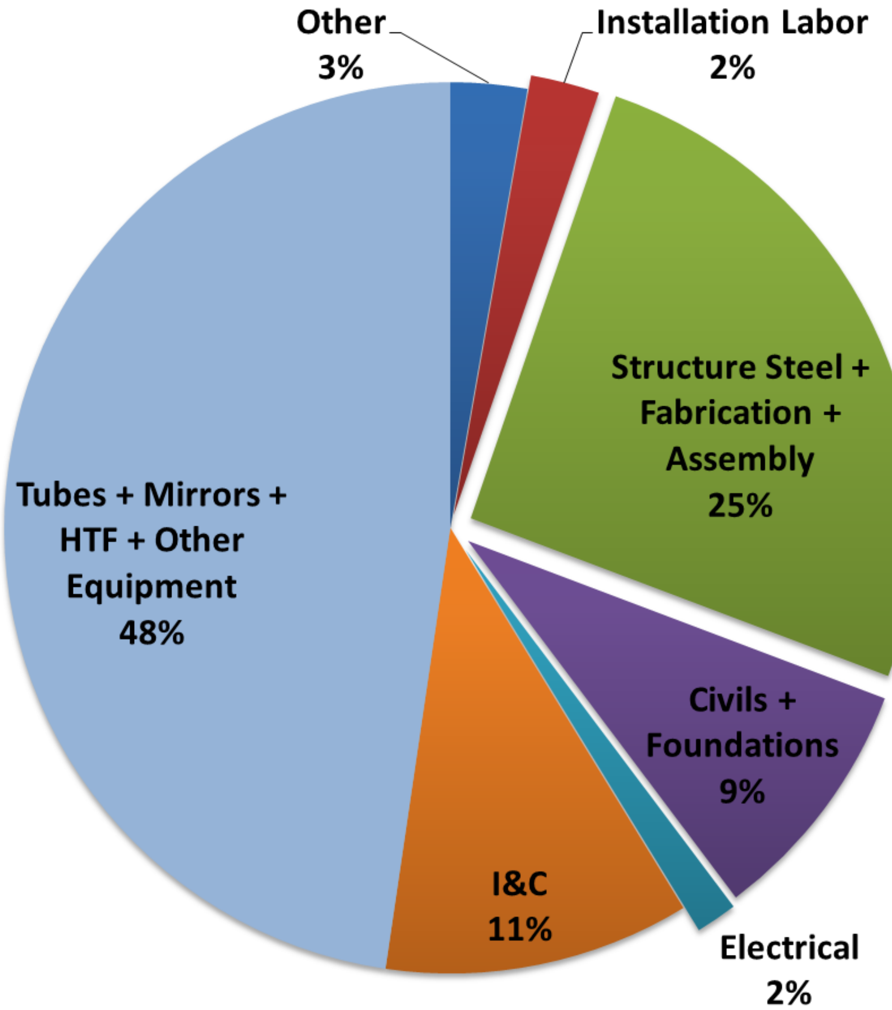
Solar Field Significant Localization Potential



Based on the current Moroccan market industrial capacity, the following elements can be localized:

- ✓ Installation Labor ~ 100%
- ✓ **Structure Steel + Fabrication + Assembly ~ 100%**
- ✓ Civils + Foundations ~ 100%
- ✓ Electrical ~ 100%

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Non-equipment Components of The Solar Field Can Be Sourced Locally From **The Very First Project**!

Ease of Localization

Easiest

Harder

Collector Assembly	Always done on site, thru a temporary facility
Civil Works	Mostly local labor, equipment and material that are available in most countries and certainly in Morocco.
Steel Structures	Other than the steel this requires fabrication (welding facilities) and suitable galvanization facilities. Usually the constraint on fully localizing this scope is existing local capacities and material availability.

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Localization Potential For Solar Field Equipment

Equipment	Output of a typical factory	Investment per factory	Jobs per factory
Mirrors	200-400 MW p.a.	30 M Euro	300
Tubes	200-400 MW p.a.	40 M Euro	140
HTF	Very High		

- Significant potential to establish local manufacturing capacity for both mirrors and tubes (taking into account the Moroccan Solar procurement program)
- Once mirrors and tubes manufacturing capacity is available in Morocco, more than **<u>80% of the solar field can be procured locally</u>**

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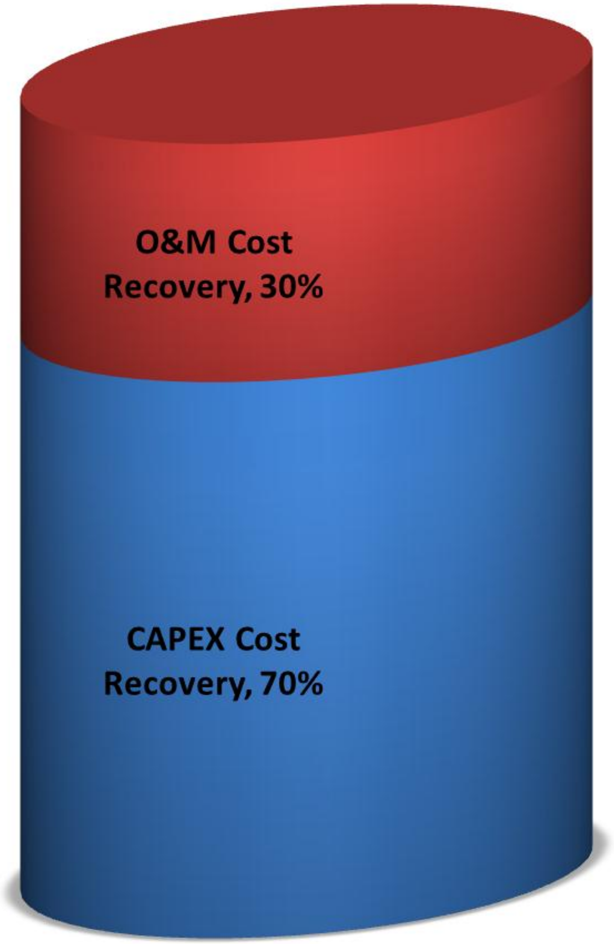
Source: The World Bank – MENA Assessment of the Local Manufacturing Potential for CSP Projects – Dec 2010

Let's Not Forget About O&M



Over the lifetime of a plant ; O&M contributes **30%** of the costs

O&M could potentially be up to **90%** local

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THANK YOU

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