Ouarzazate I CSP Project
A successful PPP combining Funding from IFIs with Private Capital

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Project Description: Technology

- 160 MW gross, 145 MW net
- Parabolic trough as result of technology-neutral prequalification process
- 3 hour storage as result of optimisation exercise by Masen and their technical adviser
- No transmission issue (66 kV line on site, 225 kV line and substation a few kilometers away)
Project Description: Institutional

- ACWA consortium selected through international bidding process.
- Ad hoc Solar Power Company (ACWA Power Company--APO) created, 75% ACWA consortium/25% MASEN
- Financing
  - Structure: 80% debt/20% equity
  - 100% of debt to be provided by MASEN, through on-lending of funds from IFIs
  - Participating IFIs (loans): IBRD, AfDB, EIB, AFD, KfW + CTF through IBRD and AfDB
  - Grants: NIF (EC) $37 million and Germany $30 million
- Offtake
  - PPA1 between MASEN and SPC @ power plant’s LCOE
  - PPA2 between MASEN and ONE @ ONE’s high voltage tariff
  - Gap between PPA1 and PPA2 to be covered by GoM
Project Description: World Bank Assistance

- **Component 1** (US$ 197m CTF, of which $100m through AfDB): support construction of 160 MW CSP power plant
- **Component 2** (US$ 200m, IBRD): provide liquidity support to MASEN to finance the difference between PPA1 and PPA2
  - Intended to ease burden on GoM’s budget during first years of Moroccan Solar Plan
  - Will also provide risk mitigation to private sponsor, as secondary outcome
- IFC may finance debt or equity for the selected PPP partner
PPP Financing structure for lowest cost and optimal risk allocation

Shareholders (ONE, SIE, Hassan II Fund, State)

Concessional financing

Carbon Finance

IFIs

Concessional financing

Grant

MASSEN

PPA2

PPA1

ONE

SPC

Equity (25%)

Repackaged debt

SPC (Solar Power Company)

Equity (75%)

PPP partners

(Δ) to be covered by GoM, or by export if possible
Contractual arrangements

- Masen as Lender
- Masen as shareholder
- Private Sector Investors
- EPC Contractor

- Special Purpose Company
  - Loan agreement
  - Equity
  - Power Purchase Agreement
  - Operation & Maintenance contract
  - Construction Contract
The PPP model aligns risk between public and private.
<table>
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<tr>
<th>Risks</th>
<th>Mitigation measures</th>
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| **Implementation**                                           | - Regular support to MASEN by Bank staff  
- High caliber advisors hired by MASEN  
- Thorough list of effectiveness conditions                           |
| Weak implementation capacity of MASEN                        |                                                                                     |
| **Bid Failure**                                              | - High caliber advisor to MASEN during selection process                             |
| (Selection of financially or technically weak private partners to establish the PPP, or lack of bidders) |                                                                                     |
| **Technology**                                               | - Two-stage bidding process  
- Requirement to have project demonstrated implementation experience  
- Bonding requirements, liquidated damages, EPC Contract                      |
| **Impact on Budget / Government support**                    | - 2\textsuperscript{nd} component of the operation offers flexibility to GoM to alleviate undue burden  
- WB assists GoM in export agreement with EU                                 |
| Excessive impact on national budget due to gap covered by government → Cessation of government support while exports not yet developed |                                                                                     |
| **IFI Coordination**                                         | - Regular coordination meetings with donors  
- Donors align with WB procedures                                         |
| Insufficient and inadequate coordination among IFIs           |                                                                                     |
| **Schedule**                                                 | - Right balance between speed and technical/procurement/environmental/social/fiduciary safeguards |
| Tight schedule proposed by MASEN                             |                                                                                     |
But CSP costly: “gap” of $60 million per year for OZZI ($28 million post bid)

Before Bid: “gap” of $60m per year

After Bid: Lower capital cost, more GWh- “gap” reduced to $28 million

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**Before Bid:**
- LCOE Com: 36
- LCOE IFIs: 29
- Concessional Effect: 19%

**After Bid:**
- LCOE Com: 24
- LCOE IFIs: 19
- Concessional Effect: 21%

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Price ONEE
Gap = GoM + IFIs
Is Ouarzazate I scalable and replicable?

- **Key success factors**
  1. Location: vast resource close to markets with appetite for zero carbon energy
  2. Strong public support and close alignment of public partners and donors
  3. A dedicated agency, with backing from the government of Morocco, able to mobilise grants and concessional funds and able to manage a competitive tendering process to attract the right expertise and efficiently allocate risk
  4. Significant financial and technical contributions from IFIs
  5. Two-stage bidding process for design flexibility

- **Challenges for scaling-up**
  1. Transition to a CSP portfolio, from public support to commercial viability
  2. Reduced technology/project costs through economies of scale and replication
  3. Higher market revenues, such as from exports to EU
  4. More concessional funds in short –term, until exports and cost reductions materialise—**GREEN CLIMATE FUND** needed soon
Moving from predominantly public projects for local consumption to private for exports– Ouarzazate kickstarting

**Accelerating factors:**
- Kick start Concessional funding
- Opening of EU market
- Fossil Fuel Subsidies Phasing-out

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**By 2020: up to 1 GW**
- **Ownership:** public or long-term contract-based PPPs
- **Financing:** key role for concessional funding until 2015
- **Risk sharing:** development risks and market risk; MENA Governments, part of the financing risk

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**By 2020:** up to 1 GW

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**By 2030: between 3 and 5 GW**
- **Ownership:** MENA, Europe and global companies with long-term contracts, once the regulatory environment and market for green power matures in Europe
- **Financing:** Similar to financing for other RE projects, with commercial financing playing a key role, export credit financing can be exploited
- **Risk sharing:** More risks shifted towards the private sector as the green energy market in Europe matures and there is clarity on power export’s framework

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**By 2050:** ??

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**Accelerating factors:**
- Kick start Concessional funding
- Opening of EU market
- Fossil Fuel Subsidies Phasing-out

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**Share of concessional financing**

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**Share of exports**

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**Ouarzazate Phase I**
OUARZAZATE SOLAR COMPLEX IN 2050

*Simulated aerial view*
Thank you!