



UPDATE ON THE MOROCCAN SOLAR PLAN

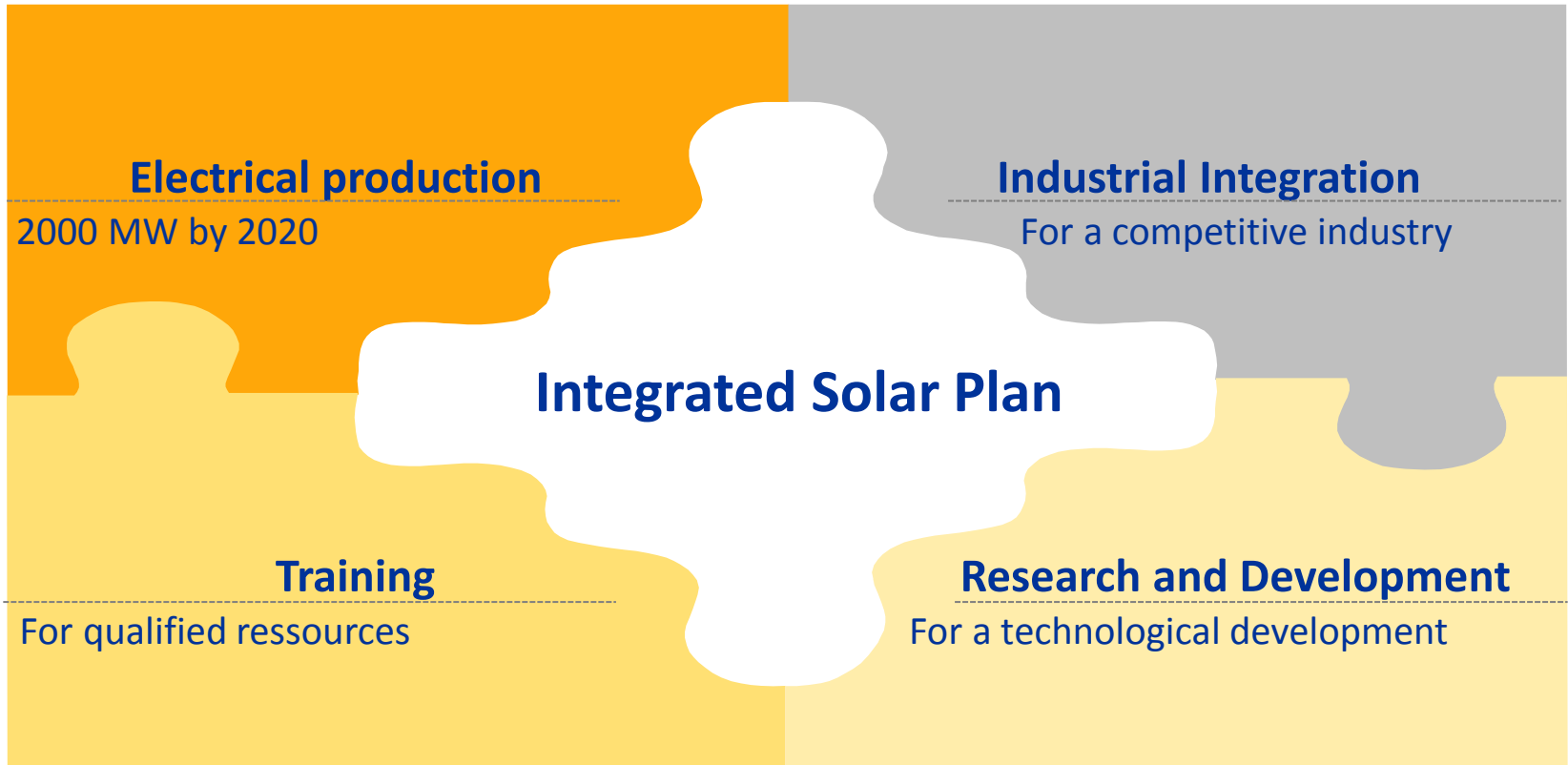
Presentation to the CTF Trust Fund Committee – May 3, 2013



Moroccan Solar Plan: Definition reminder

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Integrated plan aiming at the valuation and the enhancement of the solar resource



Solar Complex of Ouarzazate: 500 MW by 2015 / 2016

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DEVELOPMENT OF OZZ COMPLEX THROUGH PHASES

With regard to solar energy specificities, development of the complex through phases

SOLAR COMPLEX OF OUARZAZATE

500 MW

by

2015 / 2016

Various phases

★ Phase 1 : 160 MW

Phase CSP Next

Phase PV

Various technologies

CSP Trough

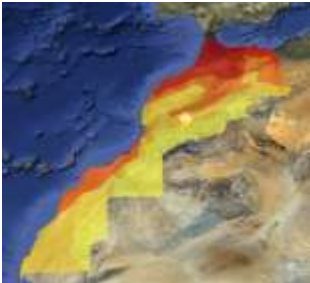
CSP Trough and Tower

Photovoltaic

With

Conception of an R&D platform

Development of common infrastructures



BEARING OF THE COMMON INFRASTRUCTURES OF THE SITE (ICs)

ICs developed by Masen, to minimize the risks related to their development and to provide increased visibility to developers

Roads	Acces road	Tasselmant road	Extension of Tasselmant road	R&D road
Hydric	Infra. for connexion	Storage infra		
Hydrologic	Drainage			
Electricity	Substation/ Cable 225 kV	Cable deviation	Substation 60/22KV	
Telecoms	Telecoms Infra.			
Site security	Security Sys.	Access Management		
Other facilities	Waste	Lightening,...		

IN PARALLEL, LOCAL DEVELOPMENT ACTIONS (1/2)



IN PARALLEL, LOCAL DEVELOPMENT ACTIONS (2/2)



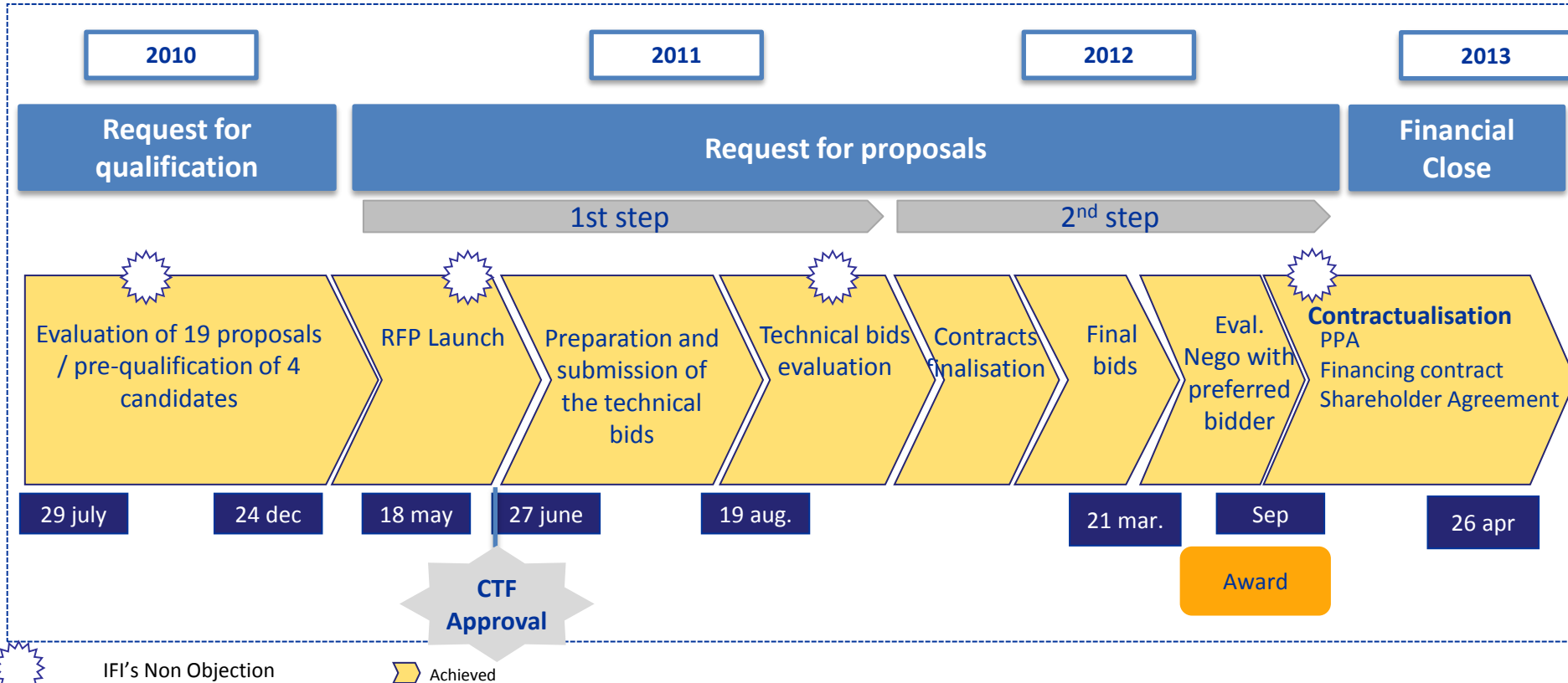
OZZ 1st Phase: Construction about to start!

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VARIOUS STEPS ACHIEVED AFTER CTF APPROVAL

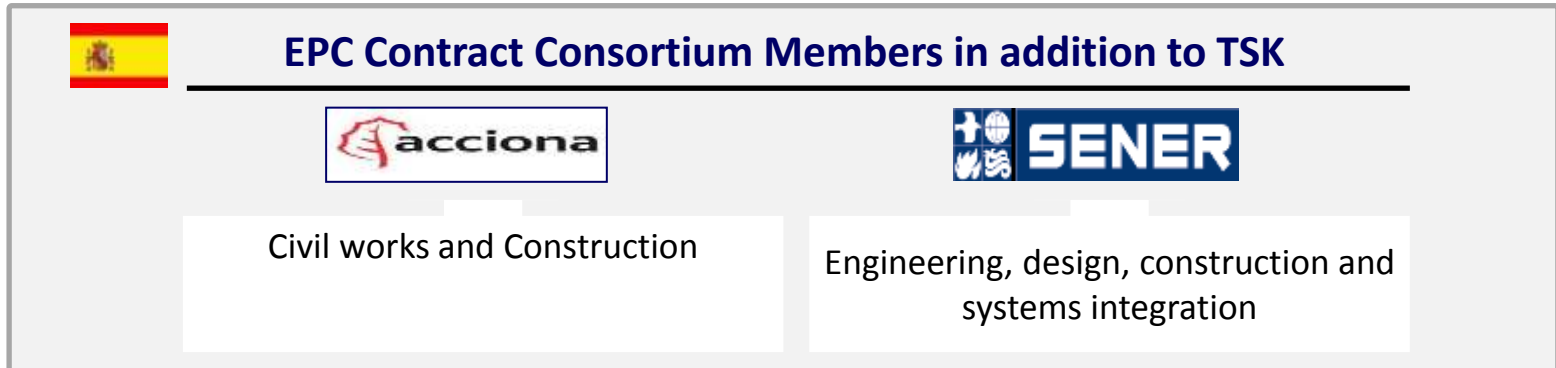
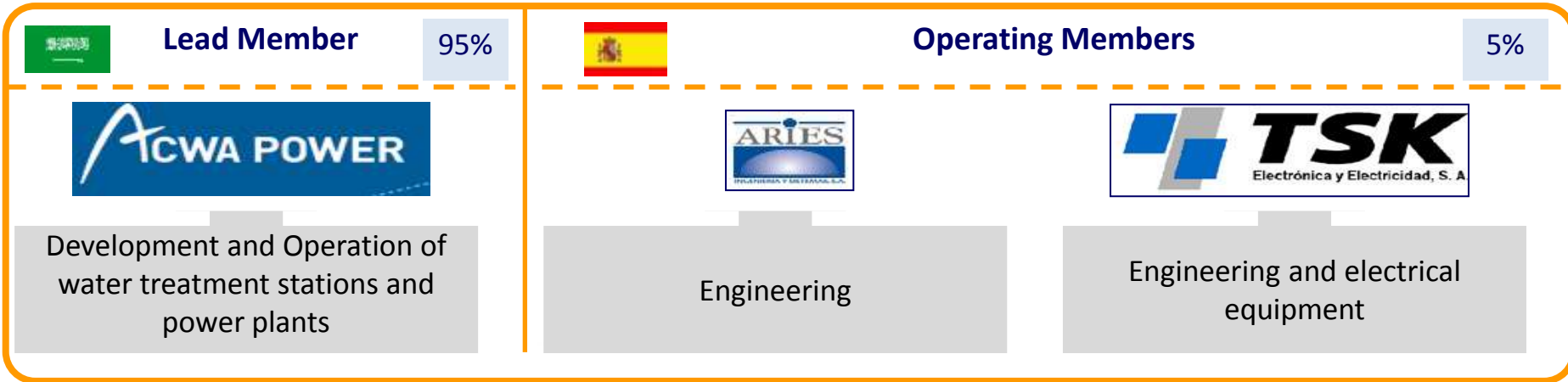
Since CTF approval, selection process and contracts achieved, with an imminent construction launch

1st phase schedule



OZZ1, AWARDED TO KEY INTERNATIONAL PLAYERS

Selected Consortium



OZZ 1, CONCRETE RESULTS OF AN OVERALL OPTIMIZATION PROCESS

After a selection process assuring a high level of competition,
award based on the best kWh tariff

A competitive tariff :

- One of the lowest worldwide
- 30% less than the last CSP awarded project

kWh price, resulting from
OZZ1 selection process

19.2 \$c/kWh

Result obtained thanks to various
factors

Innovative Structure:

- ✓ Technological Configuration
- ✓ Financing scheme

Time
Management

Financing conditions:

- ✓ Grants
- ✓ CTF concessional funding
- ✓ IFIs

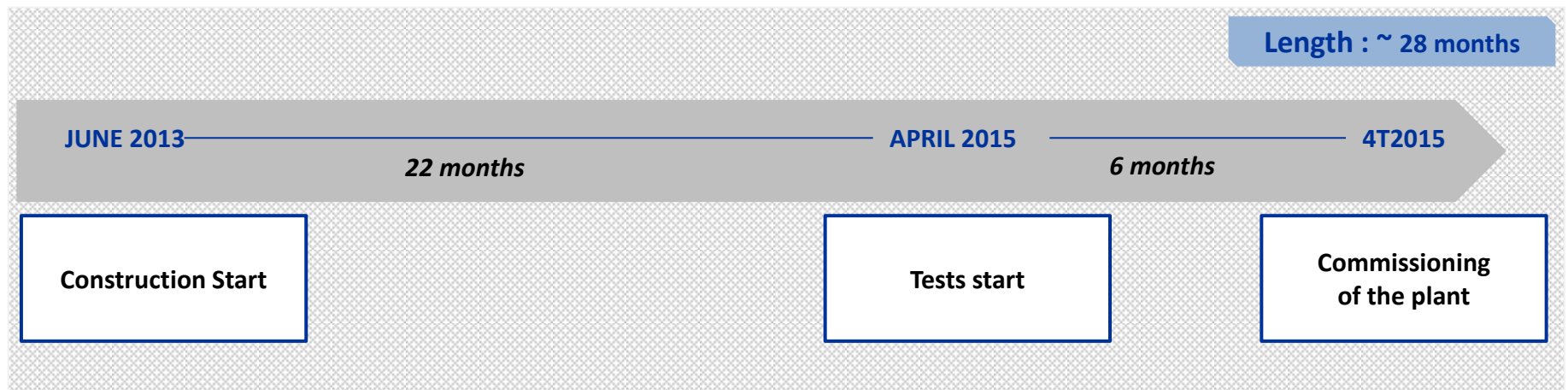
Clear and
Fair Process

Strong institutional commitment backing a clear vision and precise objectives

OZZ 1 CONSTRUCTION TO START VERY SOON

Design already started / Works to begin in the coming weeks

Estimative construction planning



OZZ CSP Next, start of the selection process

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PRE-REQUISITES MET FOR THE PREQUALIFICATION START

Consultant Team

To assist Masen on technical matters and all over the selection process

Technological and technical Consultants



Financial Consultants



Legal Consultants



Market Sounding

Over 40 reknown players in CSP technologies

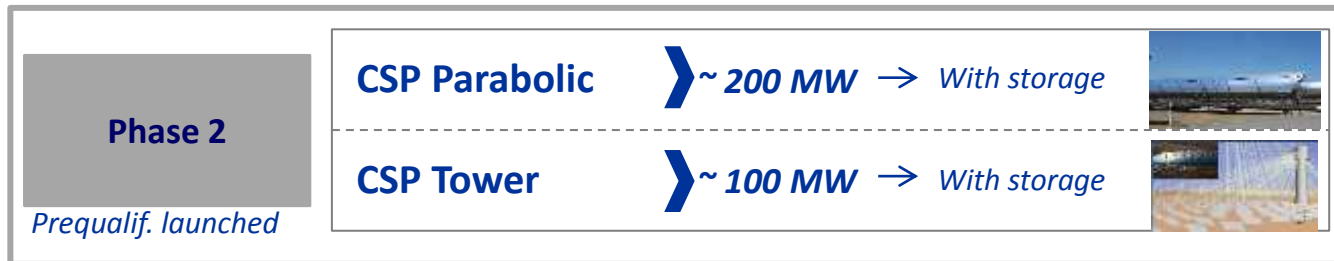


IFIs Involvement

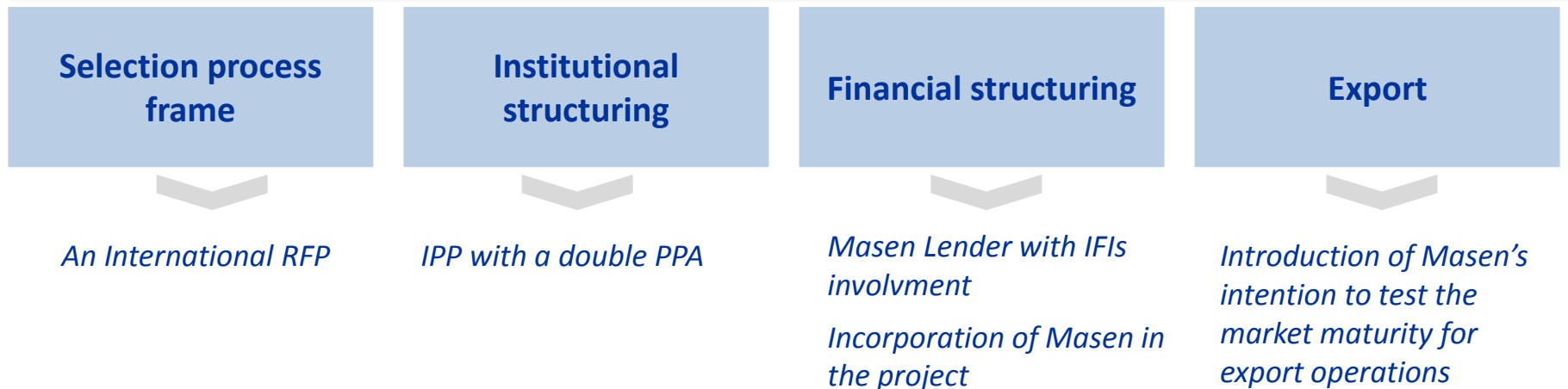
Interest expressed by the 5 institutions which participated to OZZ 1 to provide financing with advantageous conditions

PRE-QUALIFICATION PROCESS ALREADY LAUNCHED

Various conditions retained for OZZ Next structuring, already included in pre-qualification documentation



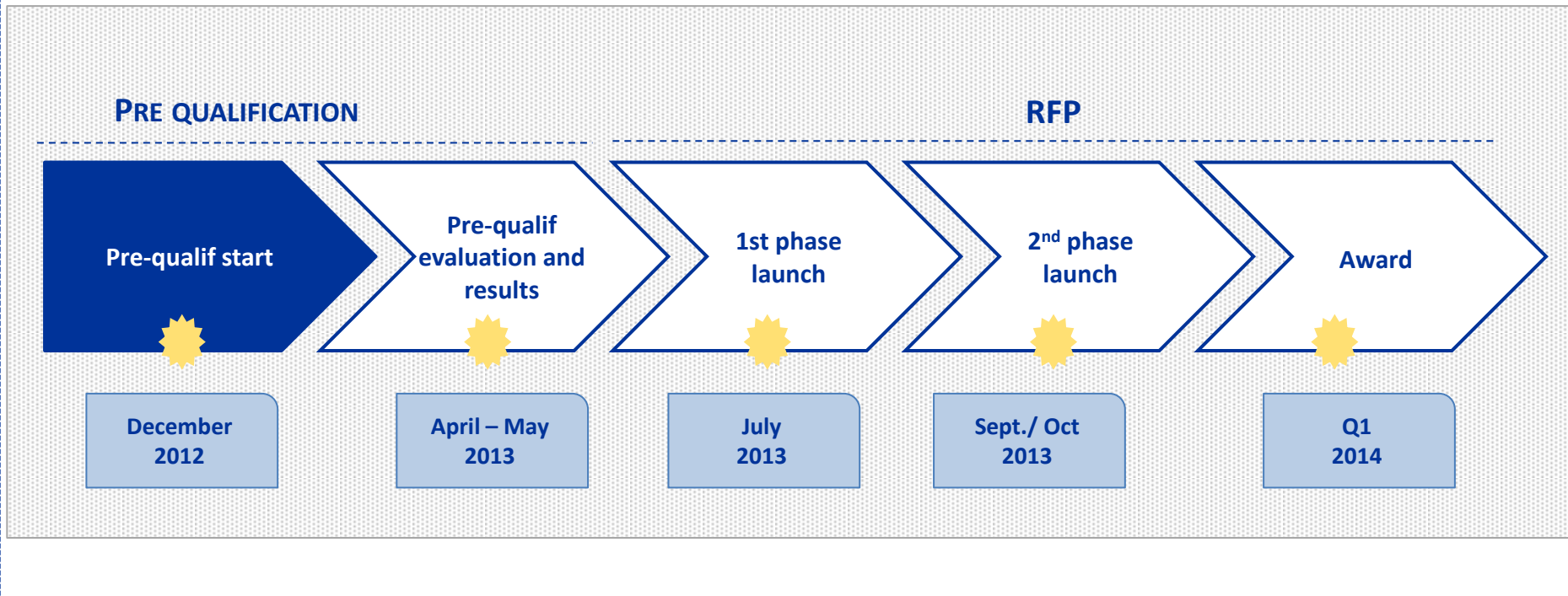
Structuring of OZZ CSP next



OZZ CSP NEXT SCHEDULE

Pre-qualification process already launched

OZZ CSP Next planning



CONCESSIONAL FUNDING REMAINS KEY

Need for the concessional funding to buy down additional costs and help bring CSP energy closer to economically viable tariff levels

CTF

Acting as a catalyst for other public and private financing

Need to maximize this contribution

Success of the Ouarzazate 1 ...

...paving the way for the success of the Entire Plan and the support for regional initiatives

Meanwhile:

- Export to become reality;
- Set-up of new financial instruments matching the sector needs;
- CSP cost decrease;
- ...

NEXT PHASES

- **EXPORT**, necessary for the Moroccan Solar Plan balance
- **LAUNCH OF NEW SITES**, to meet announced objectives
- **KNOWLEDGE SHARING**, to enhance experience and training

EXPORT, VITAL FOR THE SOLAR PLAN BALANCE

Export, common interest and will, to be realized through a particular deployment agenda

Announced will:



Article 9, facilitating the cooperation with other countries in the sector of energy

A solution which feasibility is proved , in addition to an obtained adherence from the stakeholders

- **Implementation of article 9 achievable**, as confirmed by various studies (AFD, Clinton Foundation, European Commission...)
- Deployment according to a **particular Agenda**

Asserted advantages:

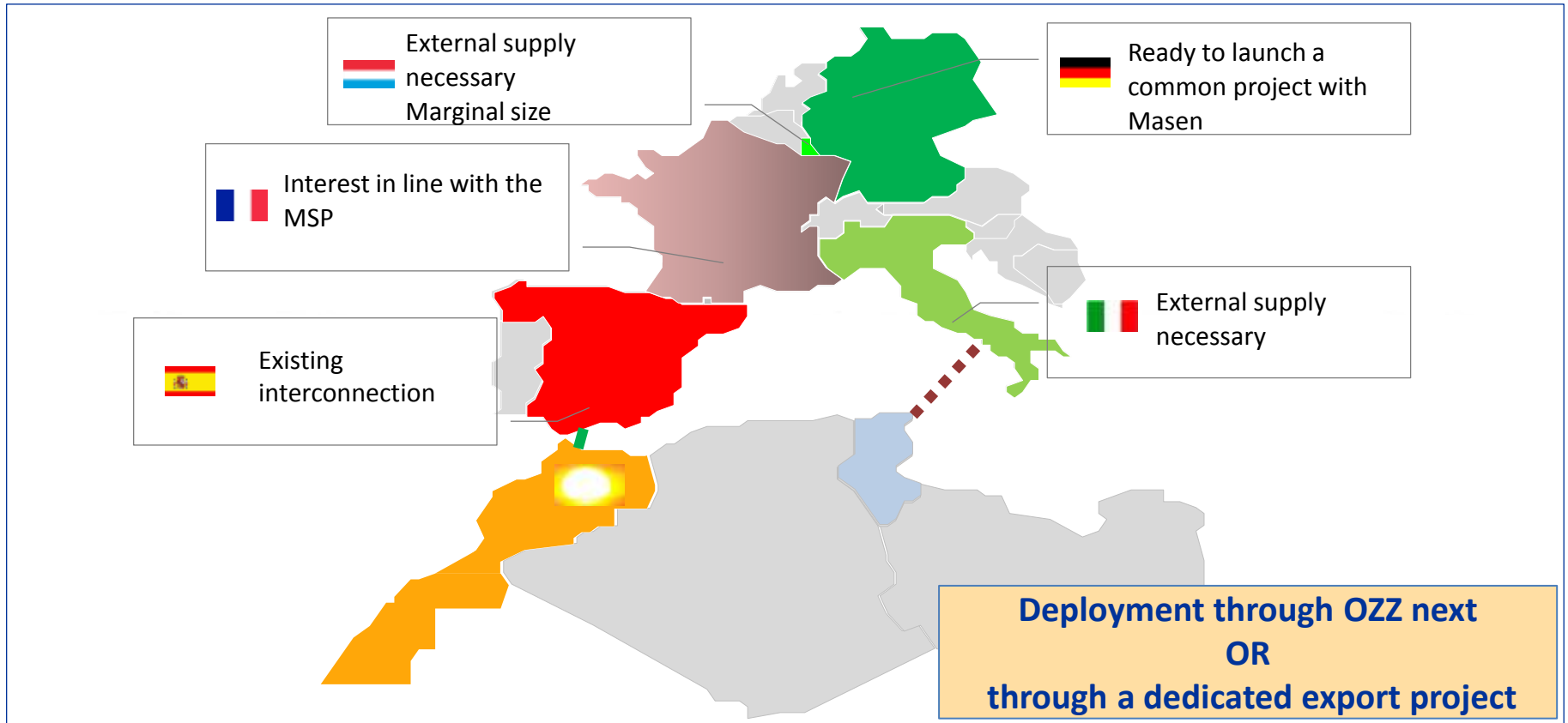


Economic balance of the solar plan

Medium/long term visibility

A NUMBER OF DISCUSSIONS STARTED, WITH CONVINCING RESULTS

Signature of a MoU to materialize the involvement of different countries, a new version is being processed by Morocco to be shared again on bilateral and multilateral basis



LAUNCH OF NEW SITES IN 2013

Development of a
Moroccan Solar Atlas

AN ACHIEVED PREREQUISITE

- ✓ Detailed mapping of the solar resource
- ✓ Identification of areas with solar potential, using exclusion and selection criteria (High Irradiation, adapted land, basic infrastructures availability...)



Moroccan Solar Atlas – GHI map



Identification of potential areas

Identification process started in order to qualify a minimum of 2 new sites at the end of 2013

Launch of **qualification studies**

- ✓ Studies : topographic, seismic, geotechnical, hydrologic, environmental, ...
- ✓ Further evaluation of the solar resource on site, in addition to many other meteorological data



Selection of sites to be developed

REGIONAL KNOWLEDGE SHARING

Masen is willing to share its experience, factors of success and pitfalls to avoid with MENA countries

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- ✓ Continued communication with namely MENA and Asian countries
- ✓ Participation in **two workshops in Tunisia and in Libya with large information provided**
- ✓ *Planning of a new workshop in the region: Saudi Arabia, Jordan, ...*

Sharing on different themes

Example of themes

Key success factors of solar projects

Financial and institutional structuring of the project

Selection process phases

2010 – 2013: International tracking


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MOROCCO, # 2 MOST ATTRACTIVE CSP COUNTRY WW

Morocco's attractiveness for CSP development positively built throughout the years

- **1st country of North Africa**, present in the top 5 of the most CSP attractive countries
- **2nd over 40 countries in terms of CSP attractiveness**, demonstrating Morocco's legitimacy and credibility in the sector
- **Absence from 2010 rating**, illustrating the acquired credibility over less than two years

Ernst & Young rating of countries attractiveness

		CSP
1.	USA 	73
2.	Maroc 	57
3.	Espagne 	55
4.	Australie 	54
5.	Inde / A. Sud 	52
7.	Emirats AU 	51



**Thank you
for your attention**



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Moroccan Agency
for Solar Energy



Q & A

+

Quarzazate Solar Complex Simulation



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