CSP business models and value chain mapping: Insights from the CSP industry

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Introduction

Purpose of the study:

✓ identify the existing business models for CSP structuring across Europe
✓ provide the base for the derivation of new appropriate models

Value chain complexity + Great range of actors = No single successful business model

Main tool for CSP development

Governmental support mechanisms
Methodology

A 3-step approach:

1. Identification of business models’ aspects
2. Development of analytical framework
3. CSP industry survey
Step 1: Identification of Business Models’ Aspects

- Extensive literature survey, including position papers, company websites and reports, support mechanisms in place
- Consultation with CSP industry & stakeholders on the main aspects of business models
- Identification of business models’ aspects: BMA1, BMA2 ...

Step 2: Formulation of the Analytical Framework

- Development of the Analytical Framework, based on the identified BMA
- Consultation with CSP industry & stakeholders
- Development of a set of questions, addressing the AF parameters

Step 3: Conduction of CSP Survey

- Finalisation of the Questions and Survey Conduction
- Revision
Analytical Framework

Key topics:

1. Support mechanisms and Financing Models
2. Impact of external parameters on financial data
3. Risks and Barriers
4. Characteristics of CSP industry business models
5. Value created over the CSP value chain
6. Strengthening local elements of the CSP value chain

Key parameters:

✓ Broad geographical range of CSP projects
✓ Broad time period of mechanisms used
✓ Risks affecting primarily the core parts of the CSP value chain
“How would you characterize your company’s CSP experience with these support schemes so far?”

- All companies expressed high familiarization with FITs.
- Only one company expressed a satisfactory familiarization with green certificates.
Survey Results (2/12)

“How probable would be for your company to implement a CSP project in a country under this support scheme in the future?”

- Answers are more or less at the same level.
- Significant increase for Corporate PPAs and two tier tariffs.
Survey Results (3/12)

“How strongly do you believe the debt ratio for a CSP project would be increased based on the type of support mechanism adopted?”

✓ Most reliable mechanisms: feed in tariffs, feed in premiums and two tier tariffs.

✓ Least reliable mechanisms: green certificates, corporate PPAs and tax incentives.
### Survey Results (4/12)

**“How do uncertainties in each parameter affect the equity ratio required by project financiers?”**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bar Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Yield Predictions</td>
<td>1.75</td>
</tr>
<tr>
<td>Policy and regulatory framework of the host country</td>
<td>2.5</td>
</tr>
<tr>
<td>Project developer’s tracking record, including experience in the host country</td>
<td>1.25</td>
</tr>
<tr>
<td>Operator’s experience in similar types of projects</td>
<td>0.75</td>
</tr>
<tr>
<td>Power Purchase Agreement price</td>
<td>2.25</td>
</tr>
<tr>
<td>State guarantees</td>
<td>2.5</td>
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</tbody>
</table>

- Financial and regulatory uncertainties are predominant.
- Additional uncertainties mentioned by the respondents: offtaker’s bankability, O&M contractor’s guarantees and EPC warranties and performance guarantees.
Survey Results (5/12)

“What is your company’s experience with the different financing models available?”

- ✓ All companies are experienced in IPPs.
- ✓ Only 1 company was familiarized with green bonds and BOTs.
Survey Results (6/12)

“How important is each risk on your decision for the realization of a project?”

- Most important: regulatory, policy and revenue risks.
- Least important: administrative, technical and transit risks.
Survey Results (7/12)

“How probable is each risk during the implementation of a CSP project?”

- Most probable: financial, country and resources risks.
- Least probable: technical, transit and construction risks.
Survey Results (8/12)

“How has each barrier affected on the implementation of your CSP projects so far?”

- Most important barriers: related to regulatory and policy risks.
- Least important barriers: related to construction risk.
Survey Results (9/12)

“Which are the expected barriers for the implementation of your CSP projects in the future?”

- The overall picture remains the same.
- Mild reduction: lack of interconnections, lack of experience, lack of skilled local contractors.
“Indicate with a Yes or No the characteristics that apply in your company’s business model, and provide a short explanation in case of a positive answer.”

ML All companies have included additional services.

ML All companies have included additional stages of the CSP value chain.
Survey Results (11/12)

“Percentage of the value chain created per phase”

- Project Development: 11%
- Materials (glass, steel, sand, concrete etc.): 11%
- Components (mirrors, HTF, mounting structure, pumps etc.): 8%
- Plant engineering and construction (EPC): 46%
- Operation and maintenance: 24%
Survey Results (12/12)

“Evaluate the required conditions in order to enhance CSP local manufacturing in countries outside EU.”

✓ Local demand is considered the most important parameter for the production of relevant components.

✓ Improvement of quality assurance standards plays a significant role across all components.

✓ Training/ education has a significant contribution to installation works and the construction of CSP components.
✓ FiT scheme was the most familiar support mechanism according to all stakeholders.

✓ Stakeholders are interested in CSP investments under FiTs, two tier tariffs, corporate PPAs and FIPs.

✓ Higher debt ratios attributed foremost to FiTs, FiPs, two tier tariffs and auctions.

✓ The equity ratio depends mostly on the uncertainty of policy and financial parameters.

✓ All CSP companies have significant experience in the IPPs financing model.

✓ The most important risk regarding the realization of CSP projects is the regulatory risk.
Financial, resources and country risks were attributed the highest probability.

The most important barriers are related to regulatory and policy risks.

The CSP industry has shifted to more adaptable business models, integrating additional services and stages of the CSP value chain.

Components represent the highest contribution to the CSP value chain.

Prerequisites for strengthening the role of local manufacturers: local demand of key components, quality assurance standards of components and training/education.
Acknowledgement

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- More information: http://www.mustec.eu
Thank you!

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