

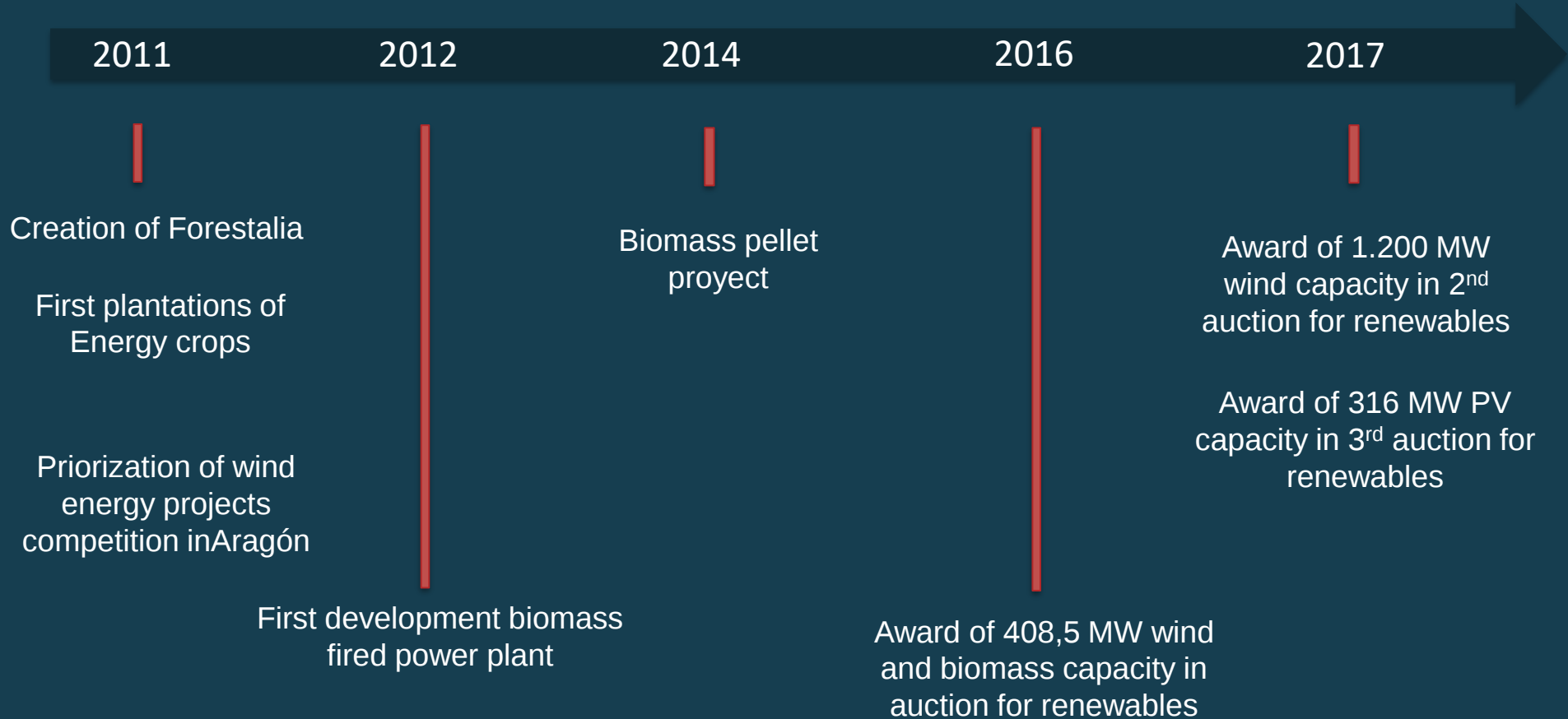


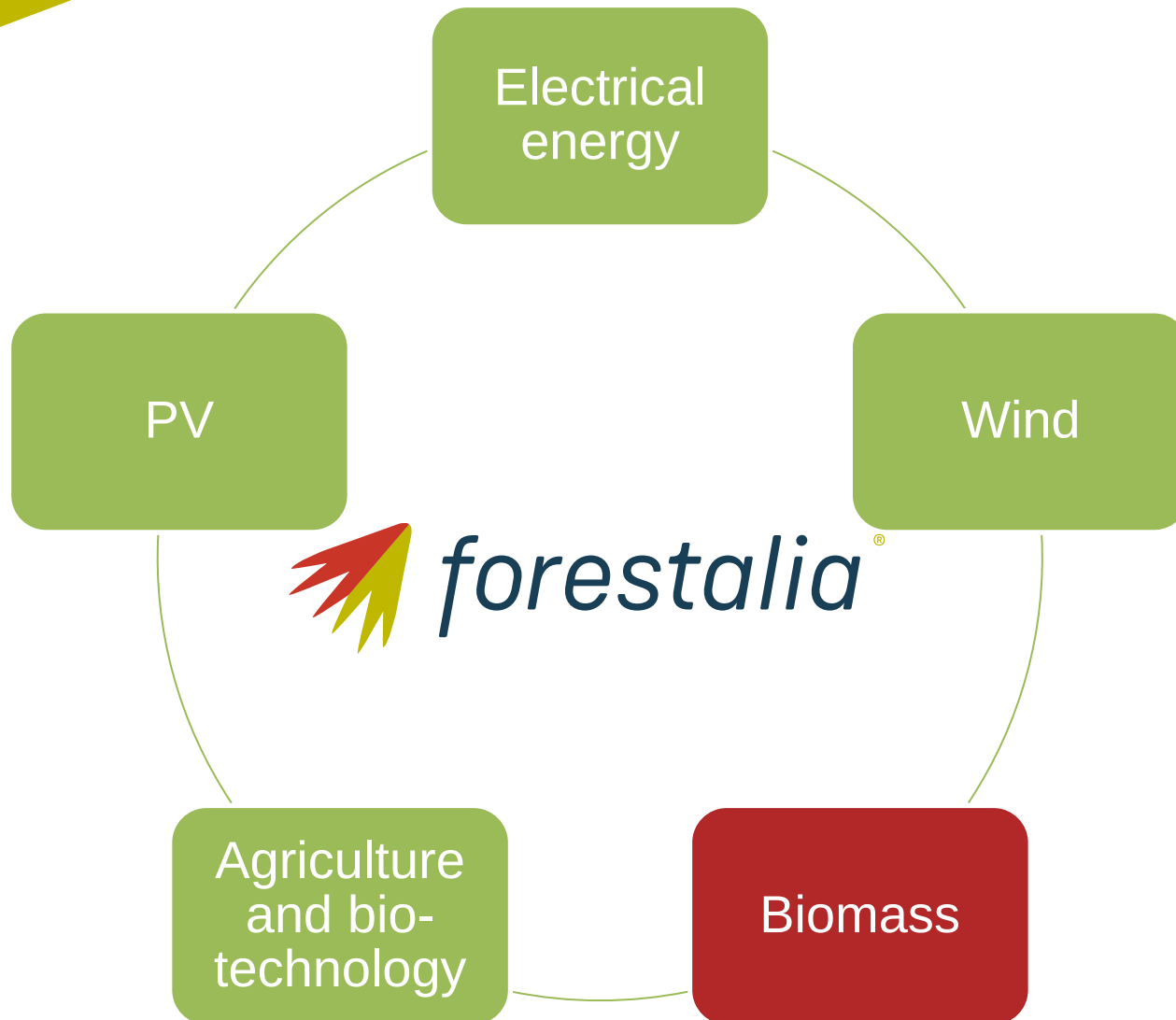
CASE STUDY OF VENDOR SELECTION CRITERIA AND LESSONS LEARNED

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Trajectory





Facility in Cubillos del Sil (León)

- Located in the industrial complex El Bayo
- **Electrical capacity:** 49,5 MW
- Possibility of **heat extraction** for domestic and industrial use
- **Occupancy** 100.000 m²
- **Total Investment** approx. 120 M€
- **Start of works** June 2018
- **PAC** expected spring 2021



Plant characteristics

Fuel exclusively of agroforestry activities, of the proximity, which will support the sustainable management of the forests of Castile and León: approx. 70% **will be poplar, pine, oak.**

Complementary, approx. 30% of the herbaceous biomass (**straw**): income to more **500 farmers** of the area

The criteria of the power auction, which is the base for the plant design, **exclude the possibility to use urban waste, industrial residues and hazardous materials**

The yearly biomass fuel consumption is estimated with approx. **300.000 tons** (less than the requested amount during EIA process due to remarkable improvement of the plant efficiency)

PLANT LAYOUT



Facility in Cubillos del Sil

- ✓ Strong alliance related to **biomass supply**: Somacyl, wood industry, agricultural cooperatives and other suppliers



boost to employment

direct employment of about 500
persons during construction phase

50 employees during O&M

about 300 Jobs in forest cleaning,
biomass exploitation, transportation
and other services

Emissions

Facility with the **lowest emissions** and the **highest efficiency** compared to the currently installed facilities of this kind

Regulation

Complies with with the **latest emission limits** agreed within the EU (from 2020 on)

Technology

Pioneer in applying the **Selective Catalytic Reduction** (SCR) technology to reduce NO_x

Filtration

Bag filter **allows to avoid:**

- 99,95% of the particles PM10
- 99,65% of the particles PM2,5

Project Development



cooperation with possible vendors
in early stage of plant concept
development

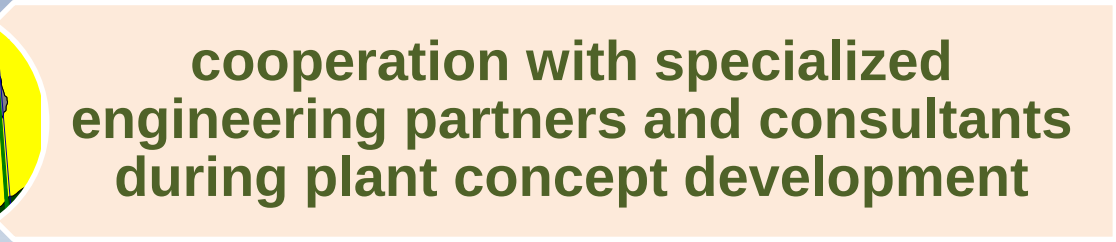


market analysis **Best Available
Technologies (BAT)**

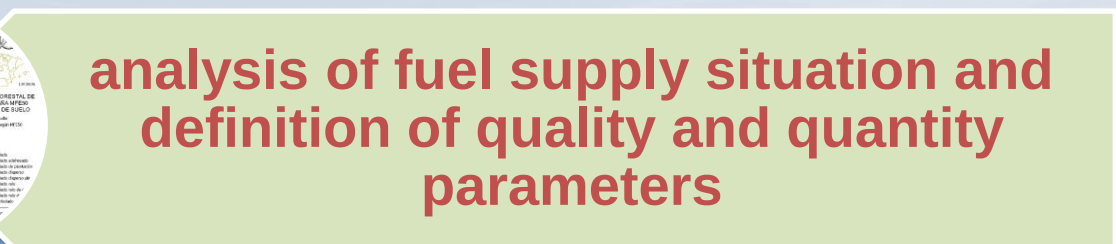


consideration of stakeholder
interests to avoid future
opposition

Project Development



**cooperation with specialized
engineering partners and consultants
during plant concept development**



analysis of fuel supply situation and definition of quality and quantity parameters



analysis of environmental impacts and consumer infrastructure

EPC-Contract Awarding Criteria



Effort in optimization of the plant design to achieve a maximum reduction of emissions and the maximization of the plant efficiency have been key criteria to award the EPC.

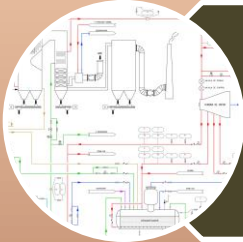


Certain track record related to experience in EPC Contract Management and financial stability.



Capability to sign a mid-/long-term O&M Contract.

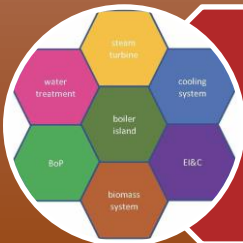
Technical Specification is the KEY!



optimization water-steam-cycle



**functional requirements and
redundancy concept for biomass
treatment and transportation system**



**adequate scope definition to reduce
interfaces and to establish clear
responsibilities**

Technical Specification is the KEY!



proven references for major
equipment



consideration of O&M
requirements



normative starting 2020		
(EU) 2017/1442		
31 de julio de 2017		
Cub.		
(annual average)		
(hourly)		
Nm ³	mg/Nm ³	mg
0	50 - 140	
	10 - 50	
	30 - 160	
	2 - 5	
	1 - 5	
	3 - 10	

clear definition of performance
requirements and test procedures

EPC CONTRACTS AND VENDOR SELECTION – A CONTRADICTION?

- **Project contracting and execution impacted by financing criteria**
 - **Financing institutions require EPC Contract model to reduce risks**
 - Limited influence by the Promoter related to subcontracting by the EPC Contractor -> clear definition of selection criteria for major equipment/systems before EPC Contract awarding (design, list of key suppliers, origin of suppliers, criteria for references, expediting requirements etc.)
 - Specification of limitations related to scope interfaces for subcontracting of major equipment/systems during EPC Contract awarding process (to guarantee reduction of interfaces during project execution)

EPC CONTRACTS AND VENDOR SELECTION – A CONTRADICTION?

- **Supervision during project execution (engineering, procurement, installation, commissioning, O&M)**
 - **Turn-key-model limits influence of Promoter -> take over of liabilities <-> risk definition EPC Contract/responsibilities EPC Contractor**
 - Request for real time information during engineering process
 - Definition approval procedure, supervision and expediting criteria (!specific approvals and/or holding points could create liabilities to Promoter!)
 - Detailed reporting procedure and scheduling requirements
 - Installation of specialized supervisors on site

LESSONS LEARNED...

- ✓ More intense involvement of possible vendors during the concept phase and the preparation of the technical specifications as basis for the EPC Contract
- ✓ Strict claims management in case of missing information during engineering phase
- ✓ Exact definition of qualification requirements for the project execution team of EPC Contractor and awarded key suppliers (professional references) and execution of contractual rights in case of non-compliance
- ✓ Detailed analysis of technical references of possible vendors and clear approval procedure during the procurement process of the EPC Contractor

LESSONS LEARNED...

- ✓ Detailed list of approved subcontractors for mayor equipment/ systems and minor equipment/systems with high relevance related to plant functionality before signing EPC Contract
- ✓ Strict compliance with approval procedures established during project execution (engineering, procurement, commissioning)
- ✓ Tight supervision during construction period (no installation activities without approved drawings/procedures for construction)
- ✓ Regular project meetings with EPC Contractor AND key suppliers
- ✓ Preference for Joint Venture, including key technology providers instead of “pure” EPC Management Contractors without supply portfolio

THANK YOU FOR YOUR ATTENTION!



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