SOLAR PAYBACK - TRAIN-THE-TRAINER
SOLAR HEAT FOR INDUSTRIAL PROCESSES

Tendering and Commissioning

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SPB Train-the-Trainer Workshop

São Paulo, 12-14 Nov 2019

www.ise.fraunhofer.de

Solar Payback

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Tendering
Objectives

- The tendering process must assure a clear definition of the services requirements and establish a clear framework for offer assessment and comparison

  - must be objective and define clearly the scope of services to be offered
  - must clear the questions/doubts suppliers might have
  - must leave no space for alternative understandings
  - must establish clearly the format and contents of the offers
  - must establish a clear framework for offer assessment and ranking
  - must assure reliability / quality of suppliers

Tendering
Interface

- The definition of the interface for the scope of supply is paramount for a due definition of customer / supplier responsibilities

  - must be clear from the technical (e.g. connection of components), conceptual (on a design layout) and material (connection and/or interface accessories) points of view
  - must define who is responsible for what
  - establishes the border for technical description of services:
    - customer side: definition of existing facilities / equipment, objectives to be achieved with purchase of services, expected impacts
    - supplier side; definition of technical requirements of the supply

Tendering
Interface

- Might rely on internal / external engineering

- Internal engineering: the customer already has an engineered solution, described in the tender / the supplier only has to offer specific components / services
- E.g.: purchase of a 100 m2 solar field
- External engineering: the customer only has a definition of the requirements / the supplier has to provide a technical solution (including engineering) as well the components / services enabling its implementation
- E.g.: purchase of a solar system suitable for water pre-heating for a 5 ton/h boiler

Tendering
Ranking / Selection

- The definition of ranking criteria in the tendering process promotes transparency of the assessment process and guides suppliers in the proposal preparation
  - Eases and structures the offer assessment phase
  - Clears assessment procedures and avoids post-ranking/supplier selection conflicts
  - Might possibly be constrained to official regulations (e.g. public procurement)
- Possible criteria
  - Price, Guaranty, supplier track record, quality of the proposed technical solution
  - Criteria shall be weighted according to the customer preferences / priorities

Tendering
Contents

- The contents of a Call for Tenders depend greatly on the scope of services procured. A general structure might follow the following contents:
  - Introduction: Identification of the customer and general objectives and framework of the Call
  - Technical Description: objectives, identification of the interface, identification of the scope of supply, identification of all relevant technical constraints and requirements
  - Description of items: technical description of all the items to be include in the proposal (component and/or service related technical characteristics, conformity/standardization criteria, dimensioning, material properties/specification, reference component / service – when allowed)
  - List of items and map of quantities
  - Supplier access conditions
  - List of documentation/information to include in the offer

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Commissioning
Objectives

- The commissioning procedures aim at ensuring the quality and conformity of the delivered goods and / or services through testing procedures aiming:
  - the performance of critical components
  - the operation of the equipment and/or system
  - Confirmation of the supplied services / goods compliance with the planned layout and with all the applicable regulations / standardization

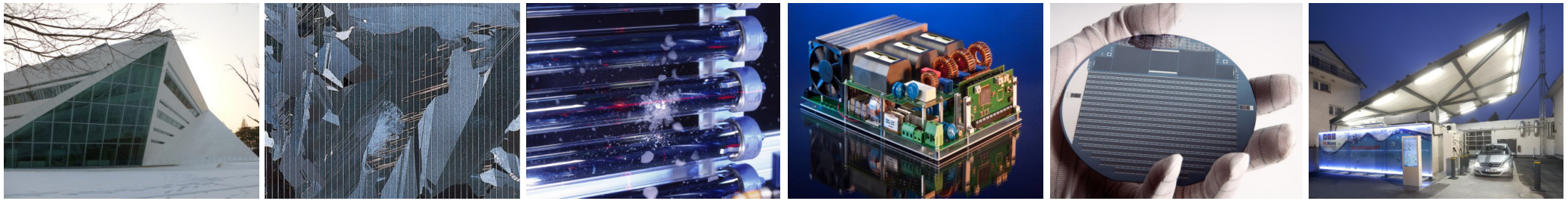
Commissioning
Controlling parameters

- The controlling parameters depend on the composition of the supplied goods and / or services, yet their definition aims:
  - the performance of critical components (e.g. control of solar field performance, heat exchangers, storage heat losses)
  - the operation of the equipment and/or system (different operation modes: normal / safety / maintenance, etc)
  - Confirmation of the supplied services / goods compliance with the planned layout (quantities, design, component location) and with all the applicable regulations / standardization (depending on applicable standards)

Commissioning
Procedures

- Besides documentation related checks, the operational procedures might include:
  - Solar field performance: measurement of HTF flow, inlet and outlet temperatures and available solar radiation, calculating the solar field performance and comparing with solar collector efficiency curve
  - HX performance: measurement of hot and cold stream massflow and inlet / outlet temperatures enabling the calculation of HX effectiviness and comparison with equipment specifications
  - Control system: test of relevant operation conditions including solar field stagnation, 3-way valve operation, HTF mass flow control after controlled variation of control variables (tempetratures, pressures, etc)
  - Safety: control of safety valves

Thank you for your Attention!



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