Macro perspectives on solar process heating

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Importance of SHIP

• Large demand for industrial process heat
  – 14% of final energy demand for industry (Lebanon)
  – 60% of industrial energy for process heating
  – Centralized units

• Large share of CO2 emissions

• Pollution through combustion (heavy fuel oil)
Importance of SHIP

- Fuel dependency & competitiveness
  - Lebanon imports > 95% of its energy
  - Adverse effect on trade balance
  - Fuel prices exceed regional average
  - Fluctuations
Importance of SHIP

- Market with largest potential for solar thermal

- Interesting sectors (selection)
  - Food, textile, tobacco, pharma, chemical, paper
Importance of SHIP

• Direct job creation / local
  – $\approx 4$ jobs per $1,000 \, m^2$ installed collector area
  – Comparison against conventional fuels
  – Comparison against other renewables

• Indirect job creation
  – Energy prices effect competitiveness
Challenges for SHIP

• Low energy costs
• High investment costs
• Financing
• Insufficient awareness
• Insufficient data
• Missing SHIP specific solution providers
• Missing successful pilot projects
• Missing supporting policies
How to support SHIP

• Characteristics
  – Support mostly not yield related like electricity
  – Design more complex (load profile)
  – Fluctuating fuel prices affect competitiveness
  – Different off-taker risks
  – Systems more “complex”
# How to support SHIP

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- Stimulate demand
- Support supply

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How to support SHIP

• Grants
• Soft loans
  – Banks need capacities for assessment
• Taxation
• Regulation
• ESCOs
  – Only indirect support
  – Legal framework
  – Denmark (district heating)
How to support SHIP

- Financing solar thermal in Tunisia
  - Leverage factor 1:5
How to support SHIP

- Infant industry
  - Pilot projects
  - Performance data
  - Pre-engineering
  - Data collection
  - Risk assessment for banks
  - Increase market size
How to support SHIP

- ESCOs

Diagram:

- ESCO
  - Credit risk / performance risk
  - Financing agreement
    - Bank
  - Heat supply agreement
    - End-user
Summary

- Importance of industrial process heat
- SHIP can contribute significantly
- Specific characteristics of SHIP market
- Complex support
- Synergies with other activities / projects
Discussion

Thank you for your attention!