DLR’s development support
For parabolic trough process heat collectors
Fact Sheet
protarget AG

- protarget AG Germany was founded in 2009 to develop, produce and sell turn-key parabolic trough power plants and solar steam boilers
- Pilot plant in Munich, Germany, with 250 kW thermal power in operation since August 2012
- 1 MW CSP power plant with storage in Italy in planning. Start of construction January 2014
- Solar process heat projects in Morocco, Chile and Spain under development
- The key business objectives of protarget are:
  - The decentral supply of electricity and process heat, steam, cooling or desalination
  - Energy to be cost competitive with fossil fuels (LCOE 0.8 €/kWh)
  - Modular power plant concepts with industrial produced components
  - Commercial scale projects in the range of 1-30 MW$_{electric}$ or 0.25-50 MW$_{thermal}$
  - Product to be capable of including local content
Technical design objectives
For a high performance process heat collector

- Decentral energy generation » integration with existing conventional systems
- Quick return on investment » Low capex and high yield
- Reduction of energy costs » the sun is free, O&M to be minimised
- Rapid deployment » Short lead time from order to commissioning
- Long lifetime » plant to run 20-25 years
Technical design features

For a high performance process heat collector

- High optical efficiency » high production yield at minimum cost
- Industrial methods of manufacturing » cost efficient, high-quality components
- Standardised power plant layouts » minimum effort in planning and logistics
- Modular concept » scalable solar plant layout

These parameters can only be achieved, if the quality and performance of each component is controlled and verified during the design process!
The DLR has supported the design process of this high performance parabolic trough module for process heat application in 3 areas:

1. Development of a parabolic mirror in cooperation with DLR and Flabeg
2. Development of a receiver tube for process heat applications in cooperation with DLR and Vacusit
3. Qualification of a parabolic trough module in cooperation with DLR and CSP-Services
1. Development of a parabolic mirror in cooperation with DLR and Flabeg
   - Maximized mirror size
   - High curvature
   - High optical accuracy
   - Stable production

Verified though testing
   - Reflectance
   - Focus deviation
   - Stability under load
   - Durability
   - Ageing characteristics
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Developing a process heat collector

2. Development of a receiver tube for process heat applications in cooperation with DLR and Vacusit:

- SolaRec – Tube performance
- ThermoRec – Heat loss test
- ElliRec – Solar simulator
- Spectrometer

Test items

- Optical efficiency
- Specific heat loss
- Coating performance
- Durability at operating Temp
- Accelerated aging
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3. Qualification of a parabolic trough module in cooperation with DLR and CSP-Services

- Deflectometry
- Photogrammetry
- Mechanical testing
- Camera-Target method

Test items

- Performance
- Optical properties
- Geometrical accuracy
- Intercept factor
- Platform rigidity
- Tracking accuracy

Development support for parabolic trough process heat collectors
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