

Technology the path to move Forward

A photograph of a solar tower power plant. A long, straight line of solar collectors stretches into the distance under a clear blue sky. The collectors are arranged in a series of parallel lines, and the perspective is from a low angle, looking down the length of the array. The sky is a deep, clear blue, and the ground is a lighter blue, suggesting a desert environment. The overall scene is bright and clear, emphasizing the technology and the path forward.

Ofer Aish
Head of Products
Siemens Solar Thermal Energy
Eilat, November 28, 2012

Borjas Blancas, Spain

Hybrid – Solar / BioMass

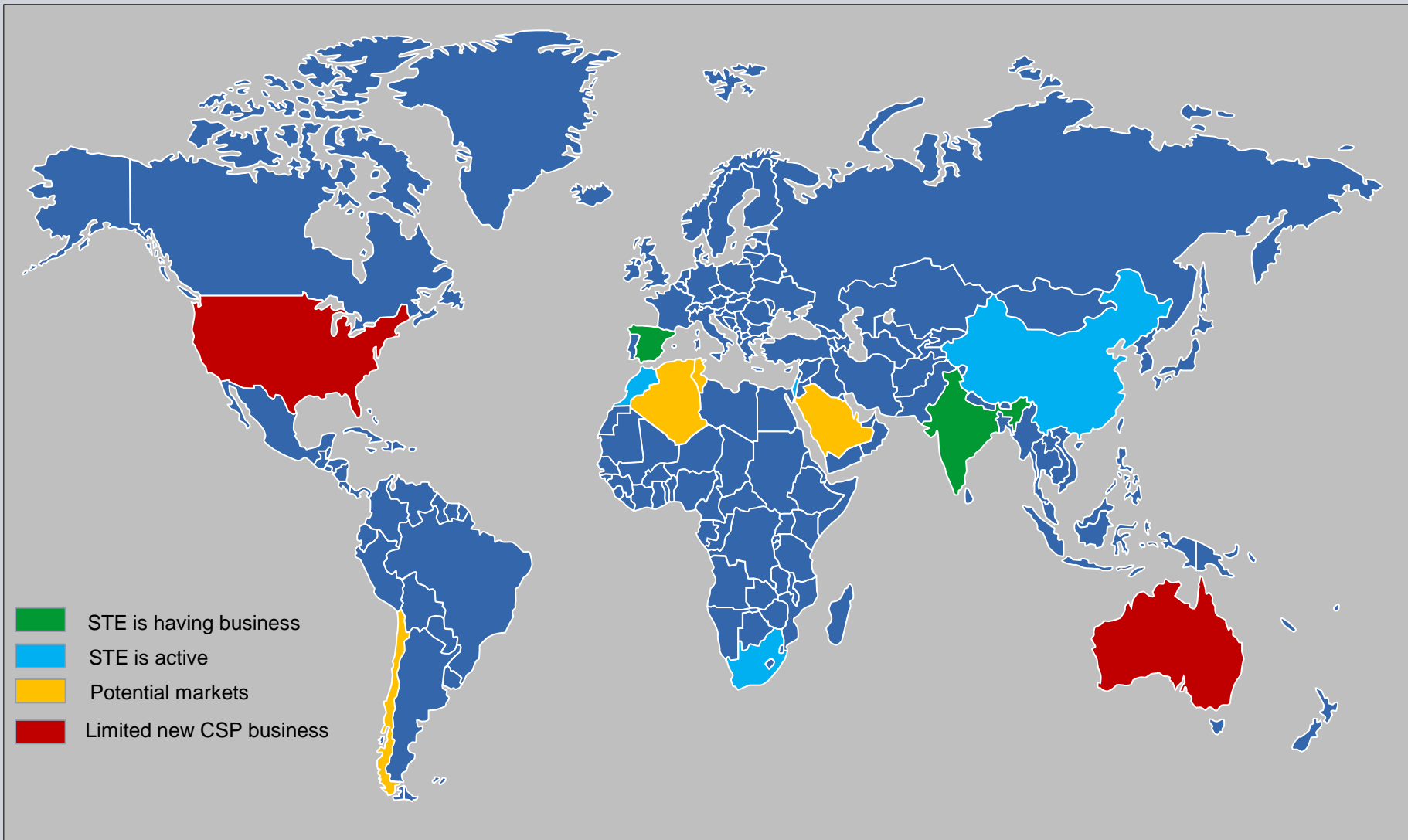


Arenales, Spain

Olivenza, Spain



2.5GW CSP Projects in 2013-2015



Spain

Most SF with capacity of 50MW

30% with 3-5 Hours Storage

Spain Royal Decree - €26c/KW hr

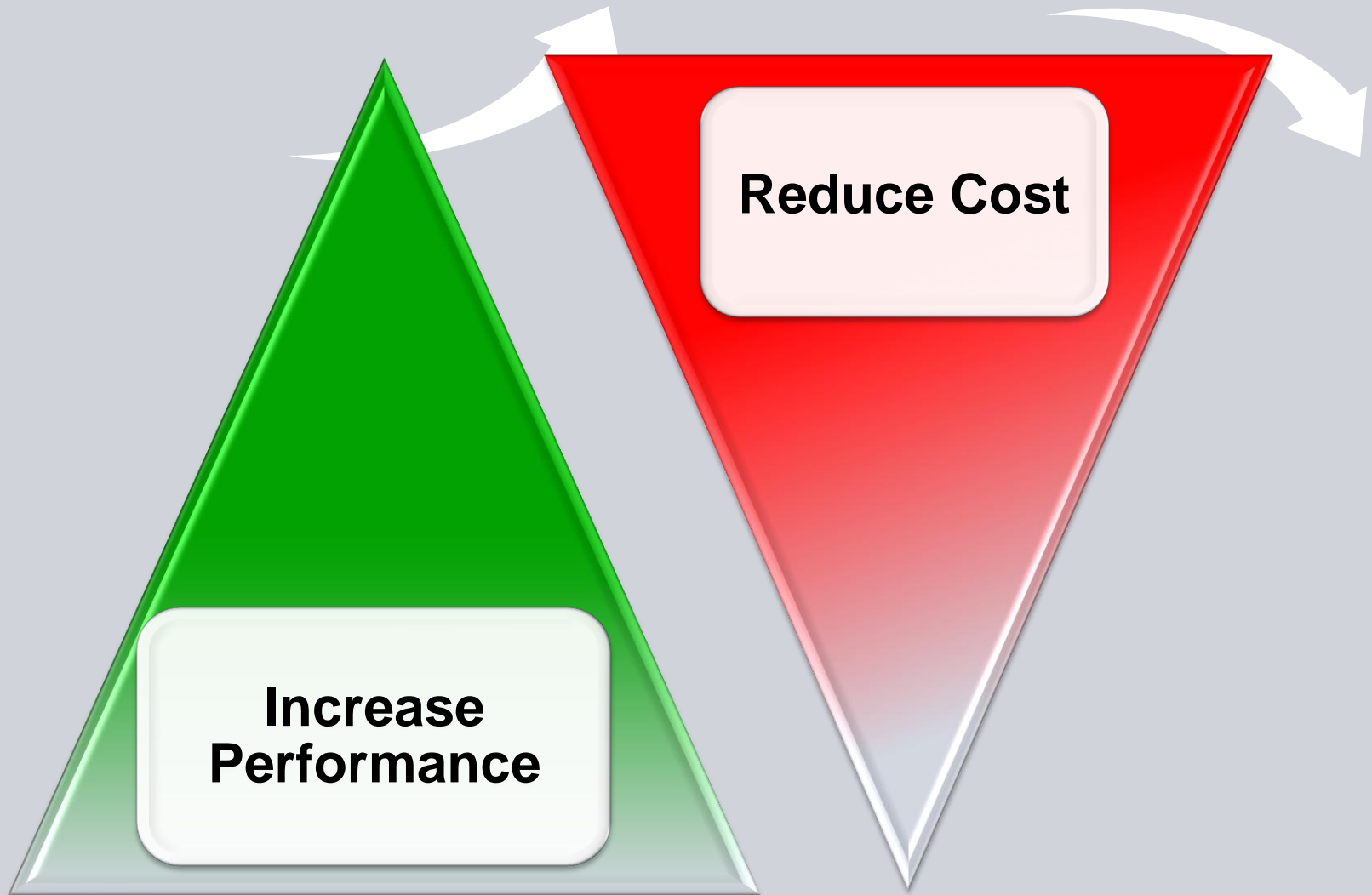
**Over all more than 2GW CSP Trough
installed in Spain**



LCOE on Average €17c- €22c

WHAT NEED TO BE CHANGE

Basics to bring LCOE down



A Leap Frog is required!



Path to Grid Parity

- **ISCC - Solar Hybrid with DSG**
- ***Tower molten Salt***
- **Fresnel Molten Salt**
- **Large Trough**
- **High Temperature HTF's >500°C**

Developments for an evolving market

STE is continuing to develop future solar receiver to lower LCOE

Higher & lower temperatures

Heat transfer fluids

Increase optical efficiencies

Standardized apertures

Cost reductions

To keep up with market demands, solar receivers must continue to evolve – and even undergo a revolution – for significant increases in efficiencies.

STE is developing its 7th generation of receivers – and beyond – which will increase thermal performance and lead to a lower overall LCOE.



UVAC 6G

SIEMENS

Reduces investment through greater efficiencies



Increased power generation

- ▶ Through enhanced SST selective coatings for reduced heat losses and improved AR coating for greater transmittance (up to 15% improvement in thermal losses)

Reduced expenditures

- ▶ Enables the building of more efficient power plants, fewer loops, with reduced CAPEX of up to 2.5% (based on typical 50 MW plant).

UVAC 6G – Improved solar thermal output and high standards of reliability

Bringing our 25 years of Solar experience and knowhow to effect

SIEMENS



Licensing our Trough Technology

- Product license (drawings, specifications, procedures, training)
- Back office and field technical support packages
- Leasing of assembly and erection equipment
- Engineering support packages (Control, Commissioning, Electrical)

STE focus on Growth

**Lowering LCOE
through core
competencies**

**Unique solar thermal
technologies**

Thank you!