

AALBORG CSP ARE CHANGING ENERGY

A ONE STOP SHOP FOR UTILITIES & INDUSTRIAL ENERGY CONSUMERS.

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- ❑ Introduction to Aalborg CSP
- ❑ A global challenge - and Sundrop Farm's idea for solving it
- ❑ Introducing the solution on a conceptual level
- ❑ The project development process and Aalborg CSP's involvement
- ❑ The vision coming into reality
- ❑ CST market segmentation Australia

Power Plants



Industrial Heating

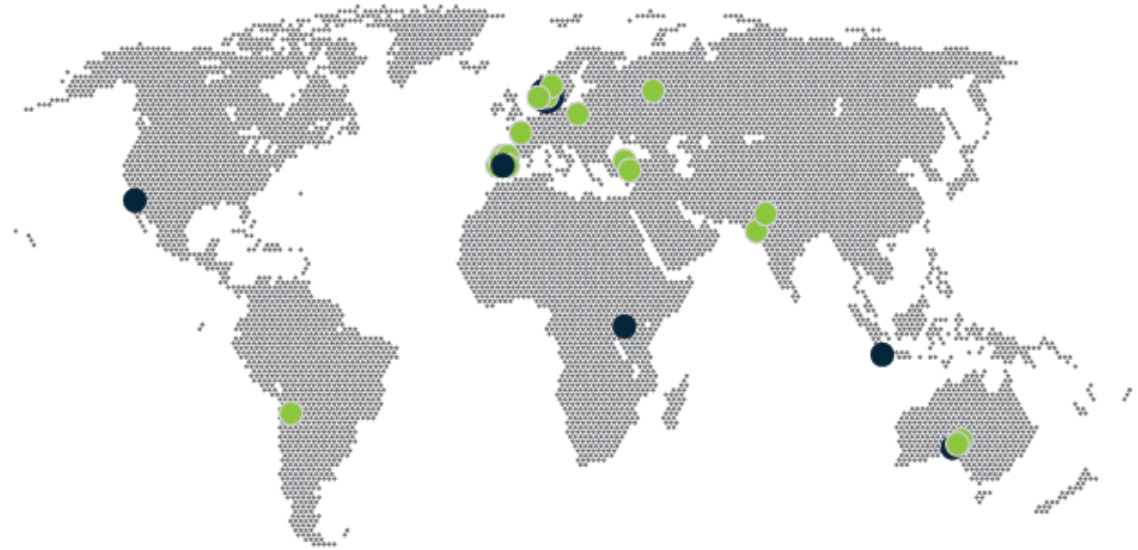


Integrated Energy Solutions



18 PLANTS IN OPERATION AND 2 UNDER CONSTRUCTION IN 8 COUNTRIES

Aalborg CSP is leading developer and supplier of innovative renewable technologies with the definite to change the way we produce energy today. Relying purpose on extensive experience from some of the most efficient concentrated solar power (CSP) projects around the world, **we design and deliver green technologies and integrated energy systems to lower cost of energy for industries and power plants worldwide.**



Offices ●

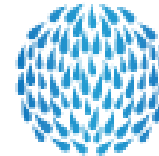
Selected projects ●



WORLD BANK GROUP

“The world needs to produce at least 50% more food to feed 9 billion people by 2050. But climate change could cut crop yields by more than 25%.”

SOURCE: THE WORLD BANK, March 21st 2016



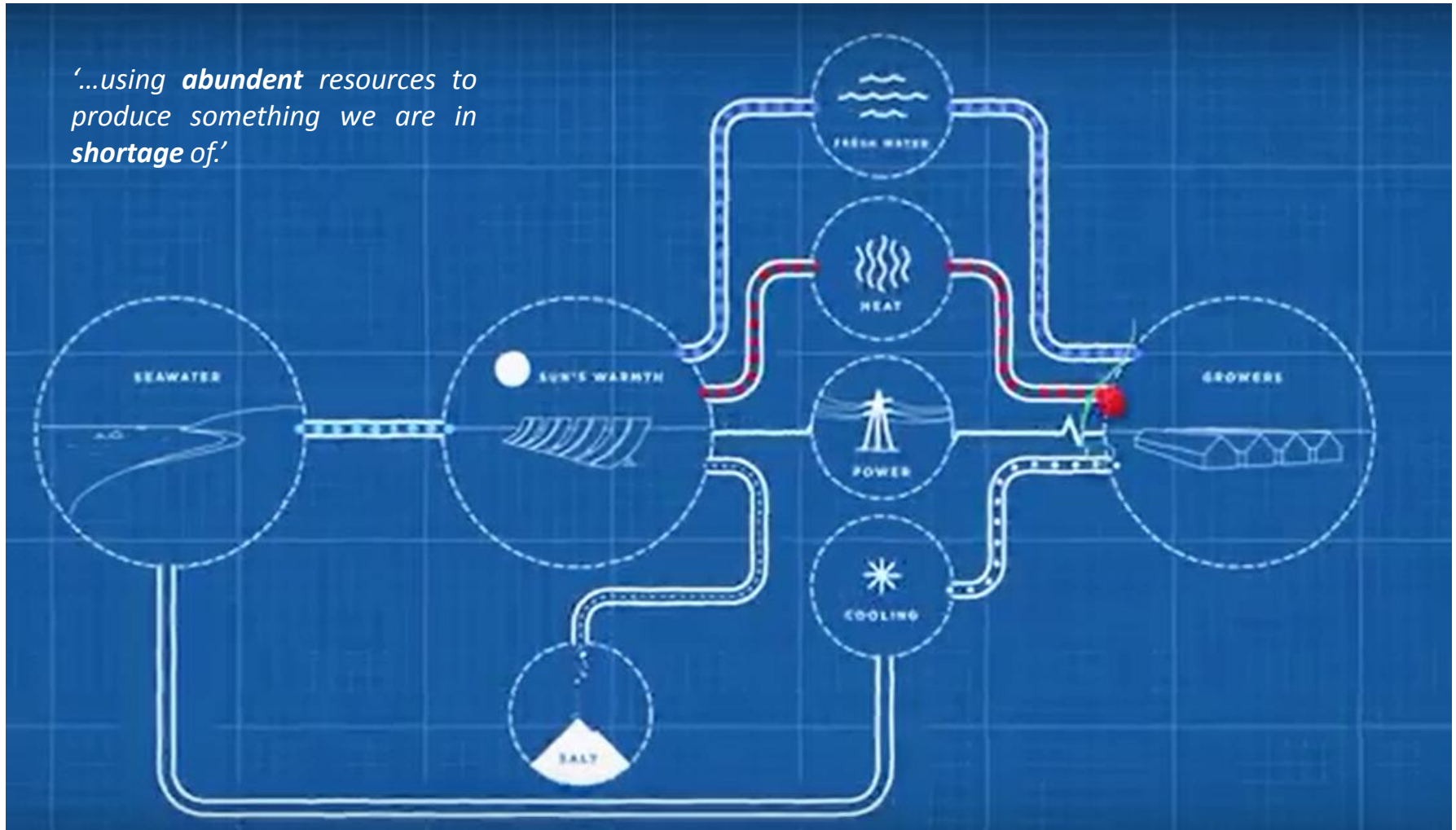
SUNDROP
F A R M S

Tomato growers with a big perspective.

Striving to make something out of nothing!

The vision is to crack a paradox – using **abundant** resources to produce something we are in **shortage** of.

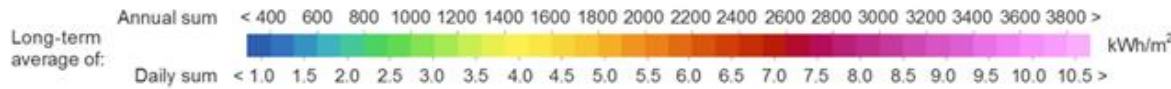
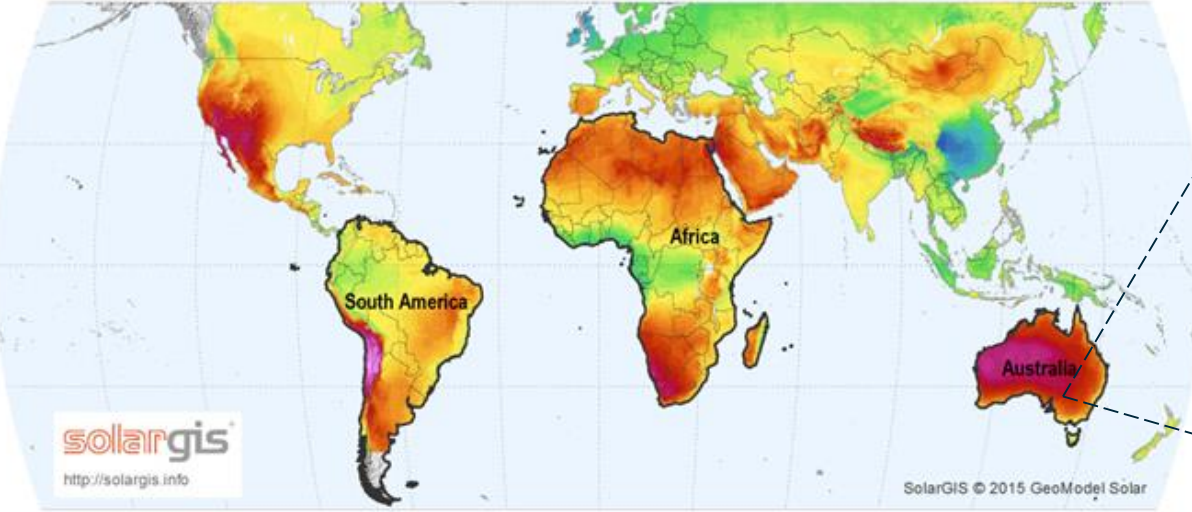
'...using **abundant** resources to produce something we are in **shortage** of.'



The proof of concept – and upscaling

WORLD MAP OF DIRECT NORMAL IRRADIATION

GeoModel
SOLAR



2010; proof-of-concept with commercial operation of the R&D facility – tomato greenhouse with parabolic trough



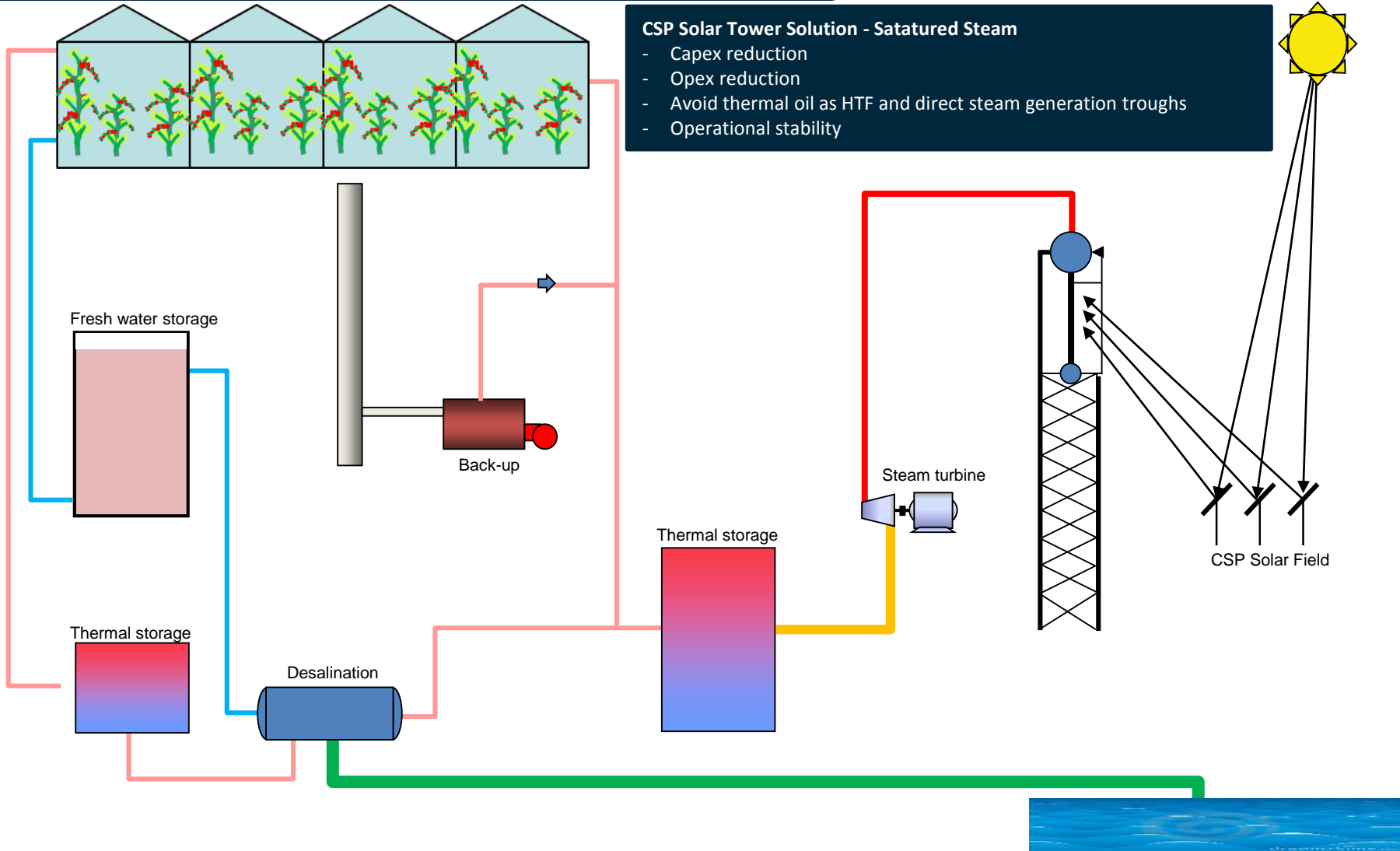
Comparative feasibility study – Solar Tower vs. Parabolic Trough

- Project capex & opex
- Operational philosophies
- Thermal efficiency
- Annual plant energy yield (power, fresh water and heating)
- Internal environmental impact assessment



CSP Solar Tower Solution - Saturated Steam

- Capex reduction
- Opex reduction
- Avoid thermal oil as HTF and direct steam generation troughs
- Operational stability





US\$ 212b assets under management



Sundrop Farms – and the vision coming into reality



36MWthp, 127 meter



51,500m²



1,5MWe



1.000m³/24h



200,000 m²



20,000 MWh



250,000 m³



1,700 MWh



14,680 tons



15,000 tons

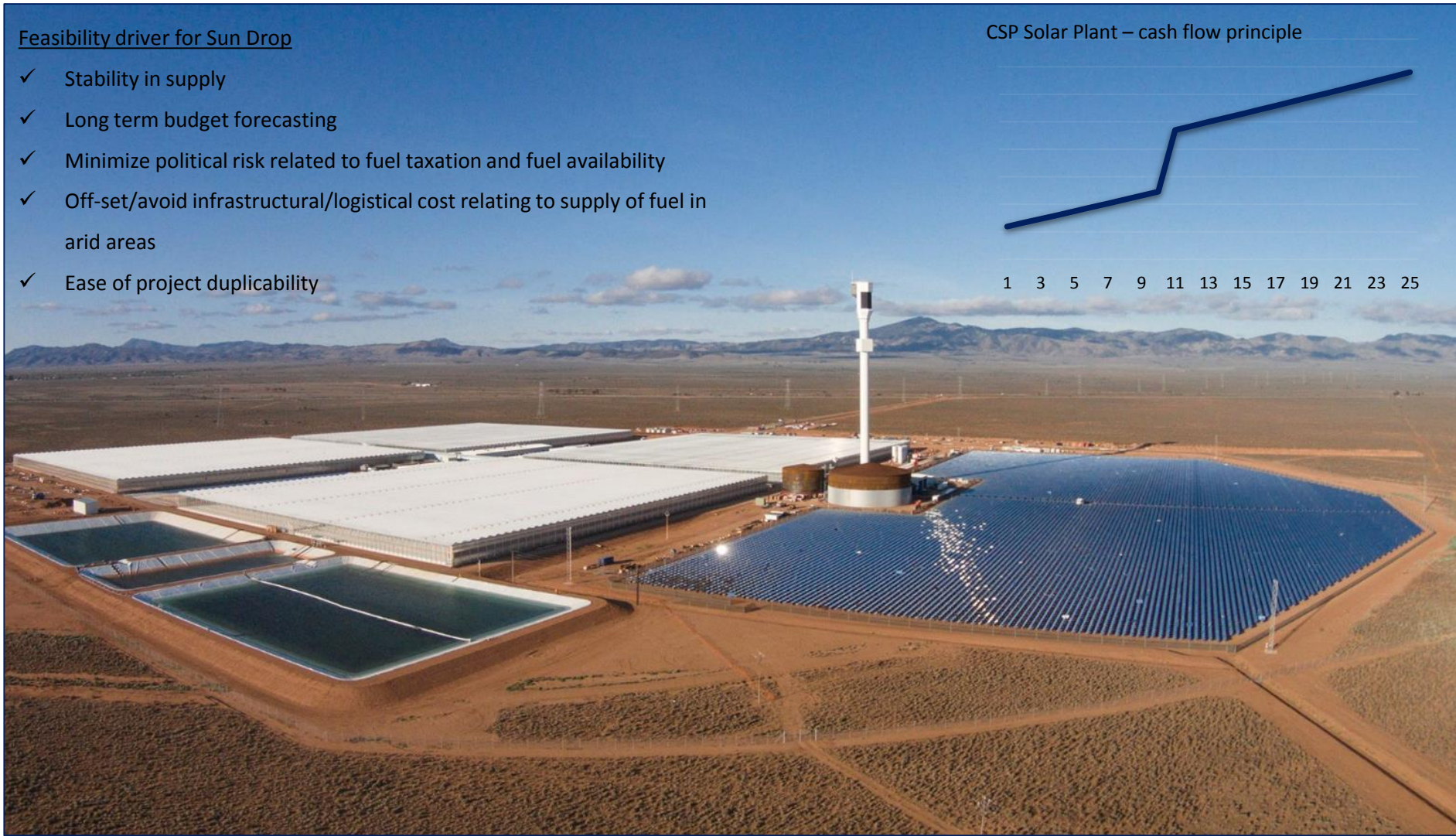


Sundrop Farms – why a CSP solution?

Feasibility driver for Sun Drop

- ✓ Stability in supply
- ✓ Long term budget forecasting
- ✓ Minimize political risk related to fuel taxation and fuel availability
- ✓ Off-set/avoid infrastructural/logistical cost relating to supply of fuel in arid areas
- ✓ Ease of project duplicability

CSP Solar Plant – cash flow principle



Integrated Energy Solutions



HORTICULTURE

MINING



ENHANCED OIL
RECOVERY

OFF-GRID
INFRASTRUCTURE



Feasibility driver for IES

- ✓ Stability in supply and budget forecasting
- ✓ Minimize political risk related to fuel taxation and fuel availability
- ✓ Off-set/avoid infrastructural/logistical cost related to fuel supplying fuel to arid areas
- ✓ Ease of project duplicability

Industrial Heating



HORTICULTURE

MINING



FMCG PRODUCTION



Feasibility driver for Industrial Heating

- ✓ Cost of boiler fuels (biomass, gas, oil and coal)
- ✓ Taxation of fuels
- ✓ Long term business structure
- ✓ Financing
- ✓ Investment incentive schemes
- ✓ Carbon reduction
- ✓ BOOT

THANK YOU FOR TAKING YOUR TIME TO LISTEN.

JENS SØNDERGAARD

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