Solving the energy crisis one sunflower at a time

23rd September 2014, IBM research Rüschlikon
...~20% of world population is still without access to electricity

- Over 1.3 Bn people are without access to electricity. More than 95% of these people are either in Sub-Saharan Africa or Developing Asia and 85% are in rural areas

- According to IEA «Energy for All» scenario ~USD 48 Bn per year (USD 1 trillion on the overall period) are needed to provide universal modern energy access by 2030, with the majority of investments needed in Sub-Saharan Africa

Source: Energy For All, World Energy Outlook 2011
Did you know that up to date...

...783 million people do not have access to clean water and almost 2.5 billion do not have access to adequate sanitation

- By 2025 1.8 Bn people will be living in countries or regions with absolute water scarcity, and two thirds of the population could be under stress conditions
- Global desalination demand is projected to grow by 9% per year until 2016, with a cumulative investment of ~USD 88 Bn

Source: Flickr - DFID - UK Department for International Development
Did you know that...

...in Europe buildings account for 40 percent of total final energy consumption

Spending on energy efficient buildings in Europe is expected to total nearly USD 800 Bn from 2014 through 2023

Source: Navigant Research Sept. 2014

Source: Flickr – Tom Chance
Vision:

“Raise the effectiveness of solar energy with integrated concentrator technologies for multi-purpose applications”
Key Features:

- Highly efficient: ~80% of the collected solar radiation is converted into useful energy
- Multiple applications
- Low seasonal dependence of output (2-axis tracking)
- Long lifetime (up to 60 years)
- Flexible product
A wide spectrum of potential customers as door-opener to several markets and sectors

### Emerging markets & Off-grid applications
- **Remote** locations
- High energy costs
- Drinking-water shortage

### Mature markets
- Availability & cost of land
- “Green building” certification
- Architectural integration & aesthetic content

#### POTENTIAL CUSTOMERS
- Farms (e.g. dairy industry)
- Remote hospitals
- Non-governmental Organizations
- Hotel / Resort chain managers
- Public institutions, urban development projects
- Small-medium size industries with needs for both electricity and heat/cold
- Utilities
- Real Estate developers
- Research Institutes
Rural electrification: India’s power shortage

- Per capita average annual domestic electricity consumption 778 kWh
- 1’500-2’000 sunshine hours per year, depending upon location

Source: http://pollinateenergy.org/issue/
Off-grid applications: Supplying the needs of island tourism

Islands tourism – hotels and resorts

• High dependency from fossil fuels: e.g. an increase of USD 10 in average crude oil price produces a 1.5% decrease in GDP in Pacific Small Island Developing States

• Remote locations

• Multiple energy needs:

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Source: IRENA 2014
After the production all the components are put in a 40’ (12m x 2.5m x 2.5m) container and shipped to the construction site.
Product customization

- Different colours of concrete
- Transparent back
- Customized height
- Cooling
- Water desalination

... and more to come!

Background image source: Flickr – Mel Stoutsenberger
Project roadmap

- 2013: Proof-of-concept
- 2014: Launch of the 1st prototype
- 2015-16: Early adopters (pre-commercial)
- 2017: Launch of the HCPVT Dish into the market
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