



CAFFEINA 2014 Conference :

IL FUTURO E LE RADICI - THE FUTURE AND THE ROOTS

Zephyr and the Energetic Autonomy

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ZEPHYR

exergy

 DALARNA
UNIVERSITY

Contents

- Off grid Solar-PV applications
- Energy in Forest Nurseries
- Zephyr alternative
- State of the art comparison



<http://web.wor>



<http://www.>



GITEWS Project

http://www.greencarcongress.com/2006/04/fossilfuel_plat.html



http://www.samsung.com/africa_en/africancitizenship/blue-internet.html

http://news.panasonic.net/archives/2011/1026_7151.html

Swedish Forest Nurseries

The oil consumption for 10 000 000 seedlings is 250 m³ at a prize of 10 000 SEK/m³.

That sums up to:

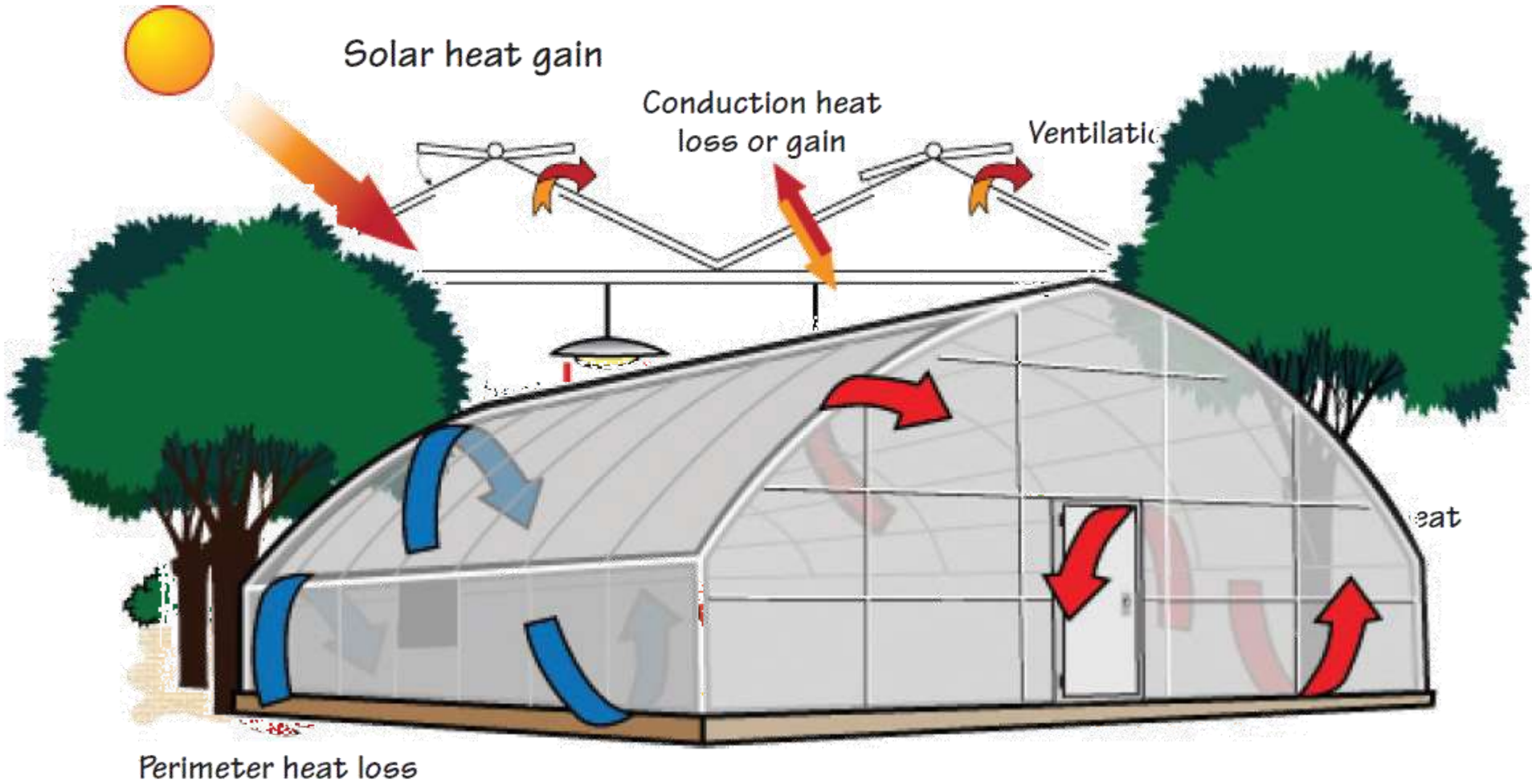
- 2 500 000 SEK corresponding to
- 0.25 SEK/seedling

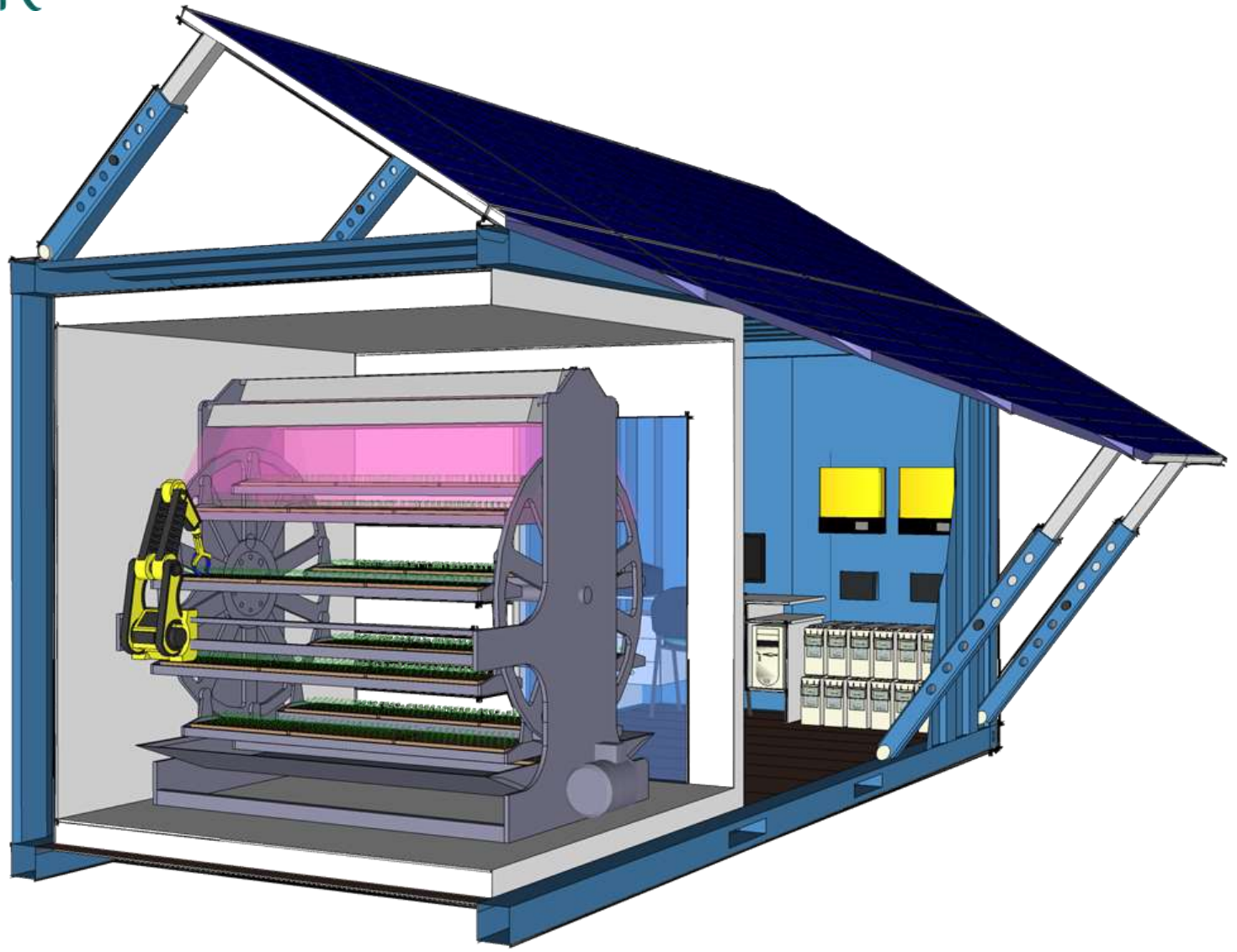
In energy terms:

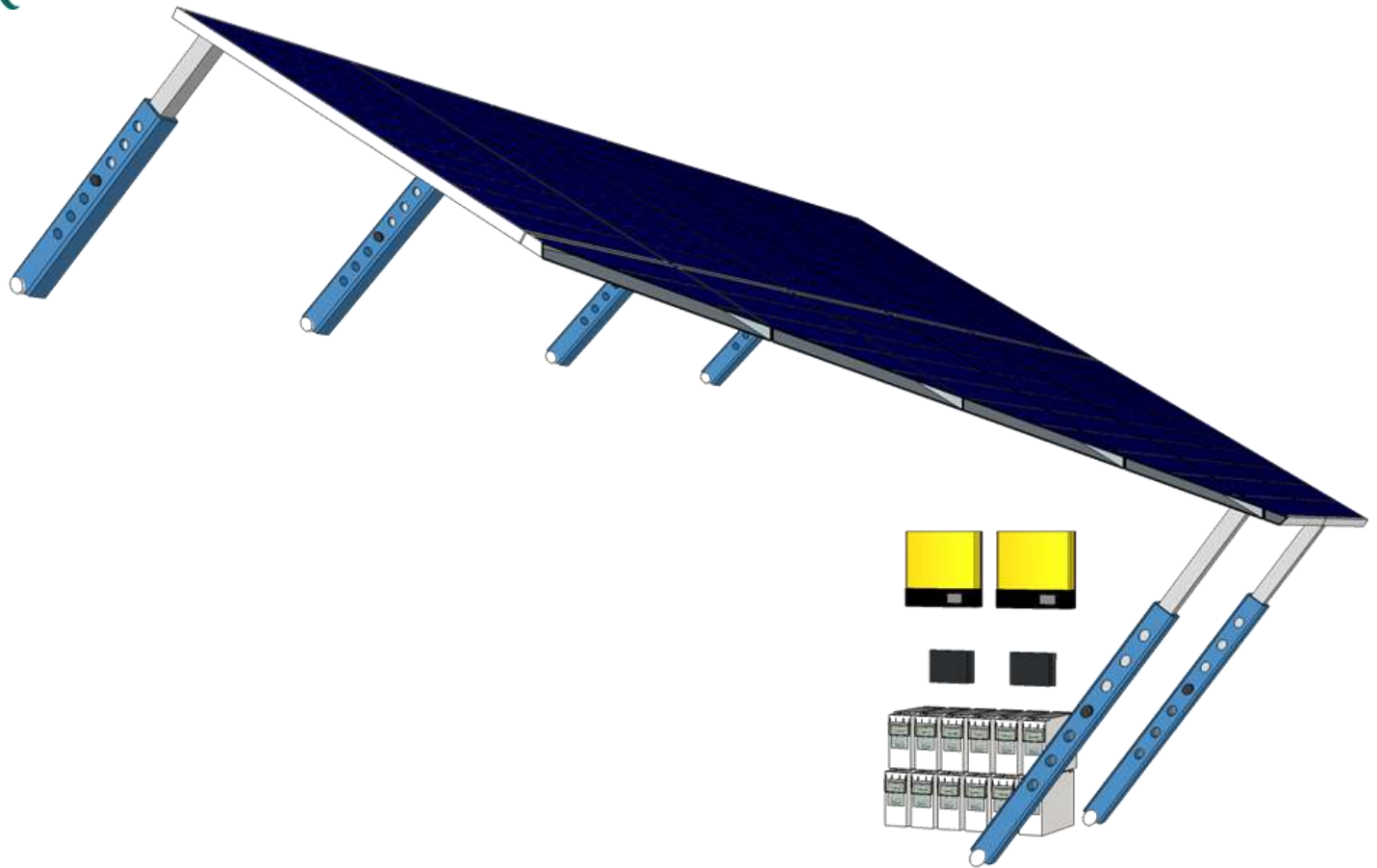
- 1 m³ of oil → 10MWh
- 250m³→ 2,5GWh
- 0,25 kWh/seedling

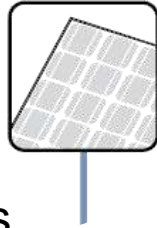


Energy in a Greenhouse



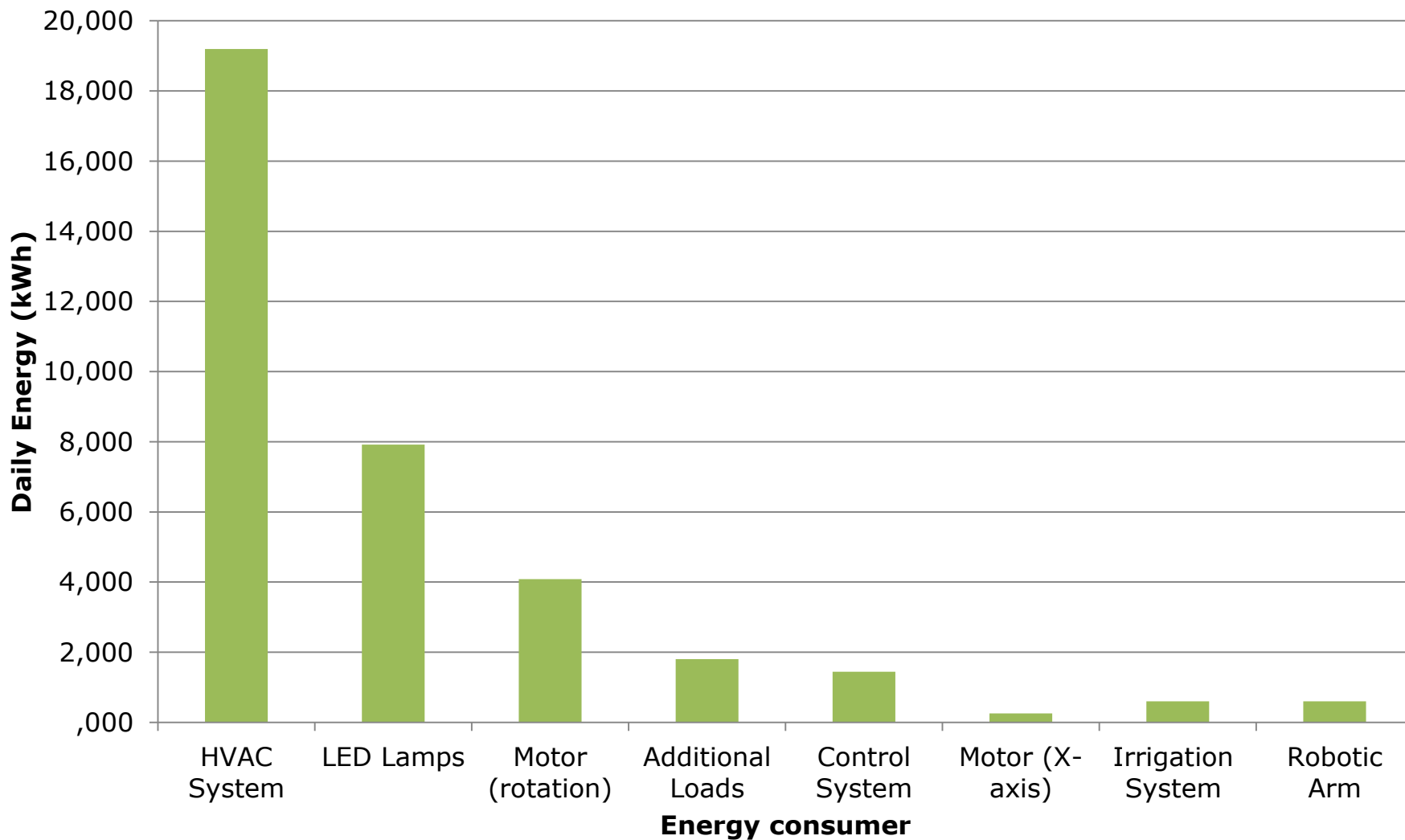






PV-panels
2,5 kWp

Energy requirements





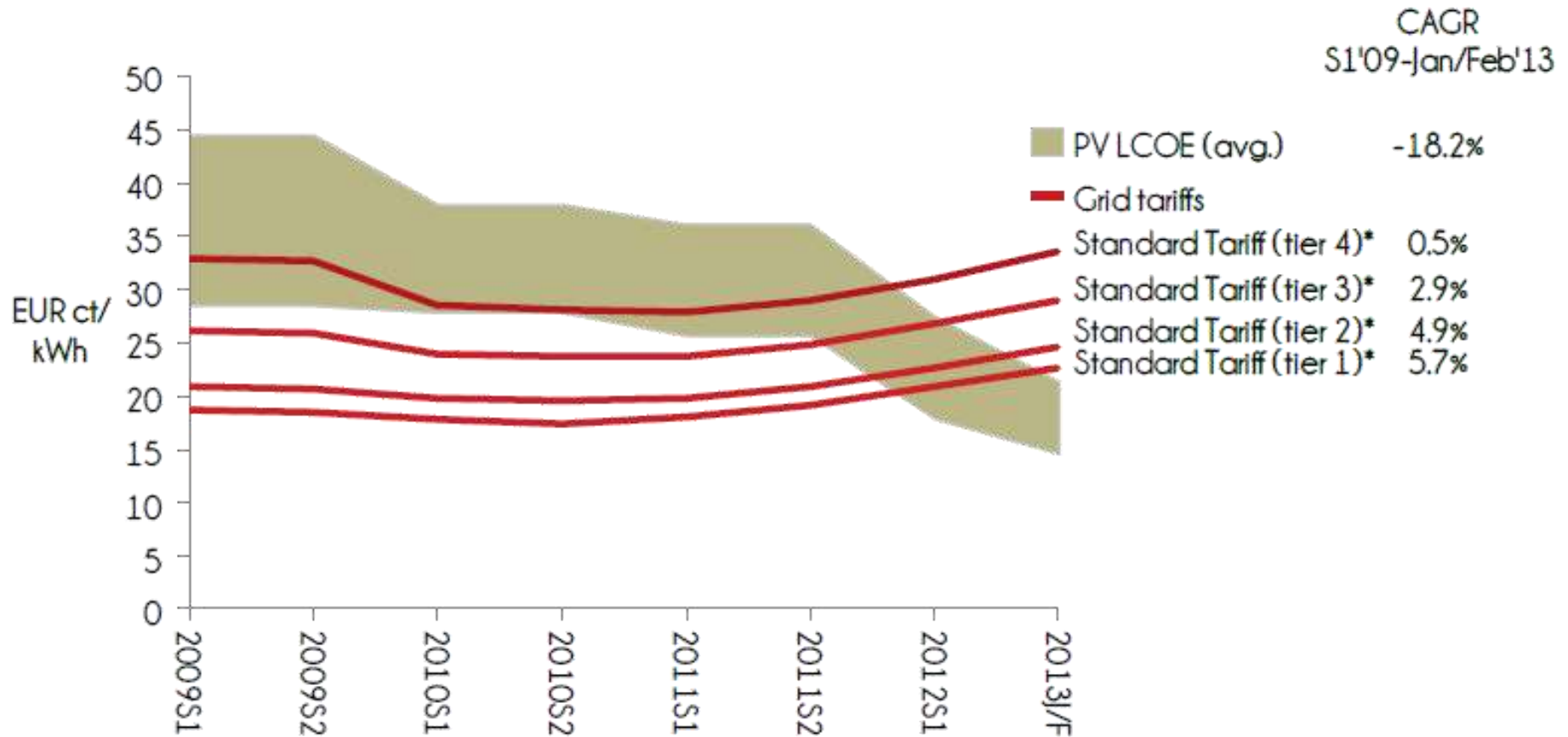
Forest nursery



ZEPHYR

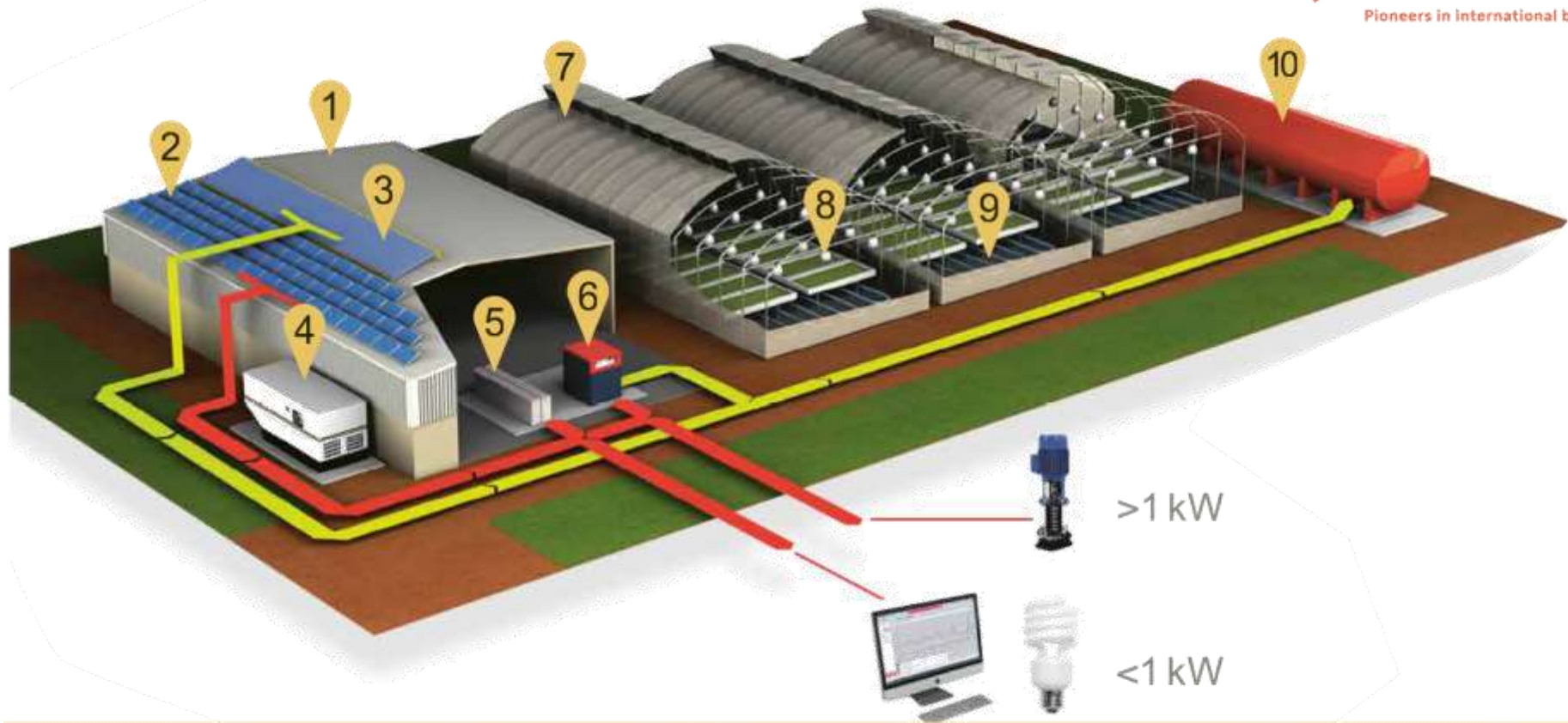
Solar energy makes sense

Household electricity costs for Rome



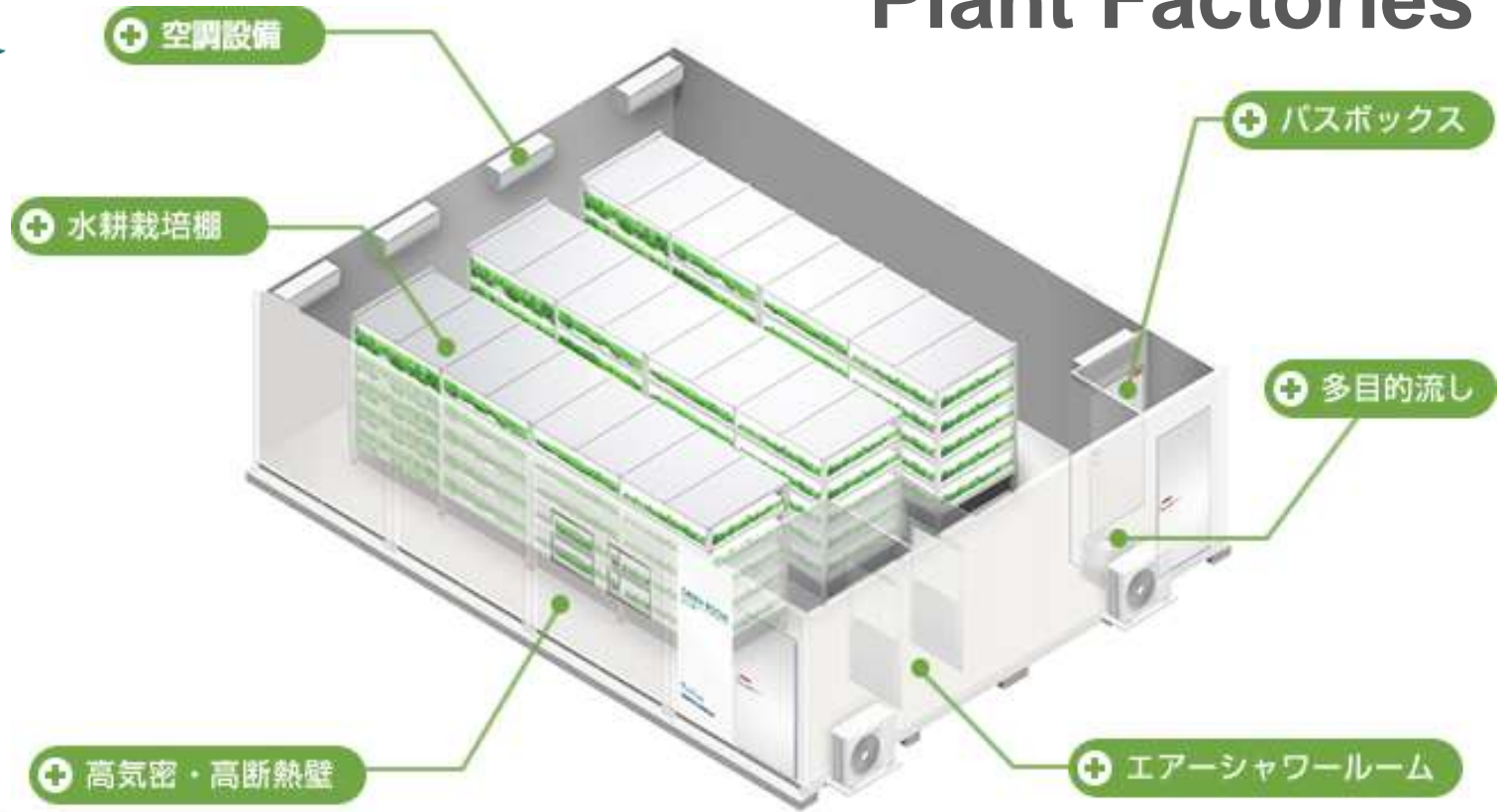
Note: * Tiers correspond to different consumption levels, tier 1: $\leq 1,800$ kWh/year; tier 2: from 1,801 to 2,640 kWh/year; tier 3: from 2,641 to 4,440 kWh/year; tier 4: $\geq 4,441$ kWh/year

Solar Greenhouse in Kenya



- 1: Processing area 2: PV panels (electricity) 3: Solar heat collectors (water) 4: Cogeneration unit (CHP) 5: Battery pack 6: Electrical boiler 7: Horticultural greenhouse
- 8: Greenhouse lighting 9: Greenhouse heating 10: Heat storage tank

<http://www.greenfarming.nl/node/392>



http://www.sankyofrontier.com/unithouse/service/plant_factory/



<http://www.adv-agri.co.jp/english/system/index3.html#s02>



FOOD SECURITY IN QATAR
IMPORTING PORTABLE FARMS FROM JAPAN



TATSUO ANDOU
MISTUBISHI CHEMICAL INC.



Amazing!

One container unit can produce

60 to 100 heads

of ice plant/lettuce per day!

The HEFL lighting unit, which works effectively as proximal lighting, can increase the number of shelves to **6!**

Up to **120** HEFL lighting units can be installed in a system!



The whole process from sowing to harvesting can be completed in one container with our original system!

The system can also be used for **seedling development.**

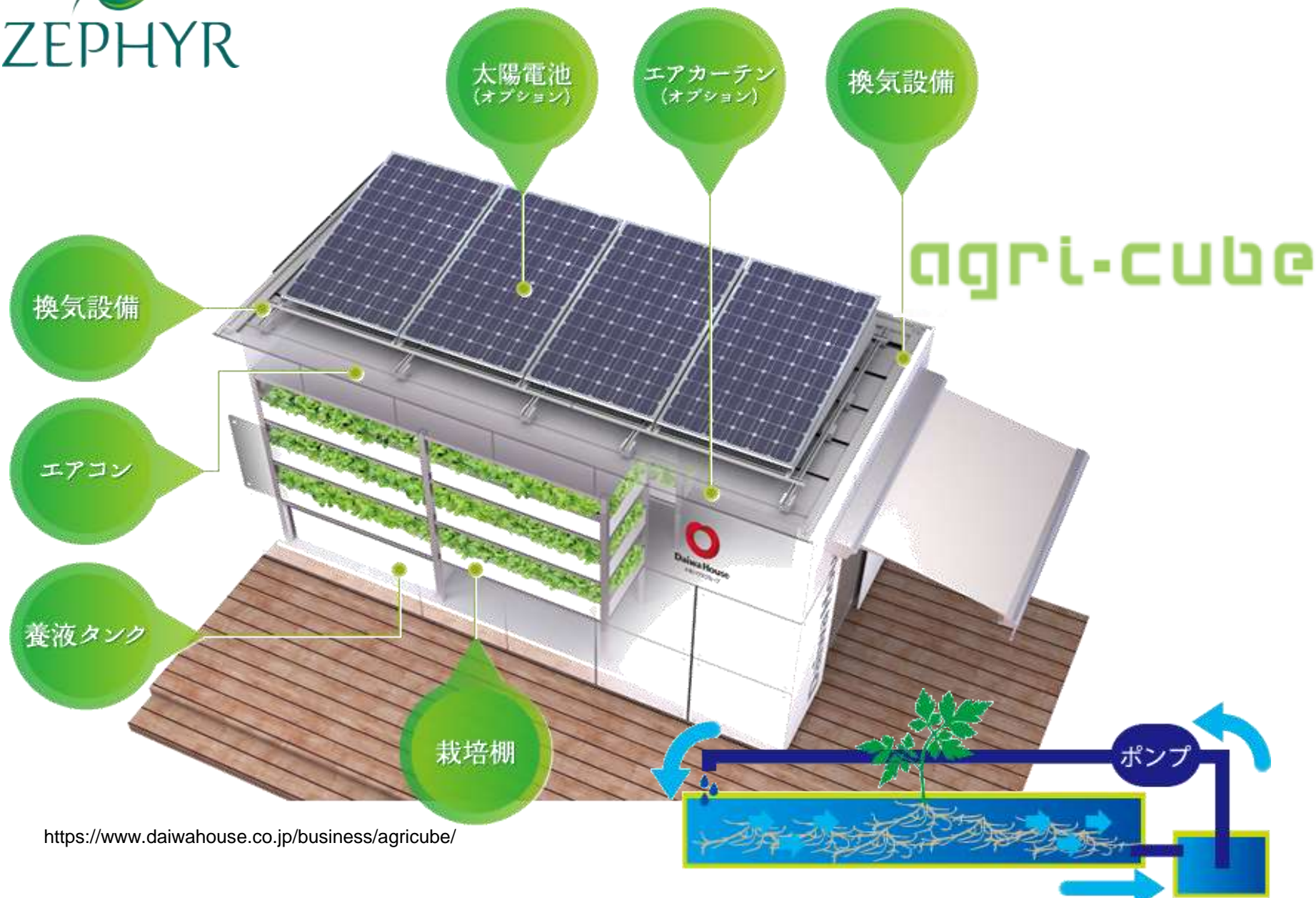


Amazing!

The system's footprint is

only **30** (9tsubo) **m²!**





<https://www.daiwahouse.co.jp/business/agricube/>





<https://www.daiwahouse.co.jp/business/agricube/>



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Thank you for your attention!




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