

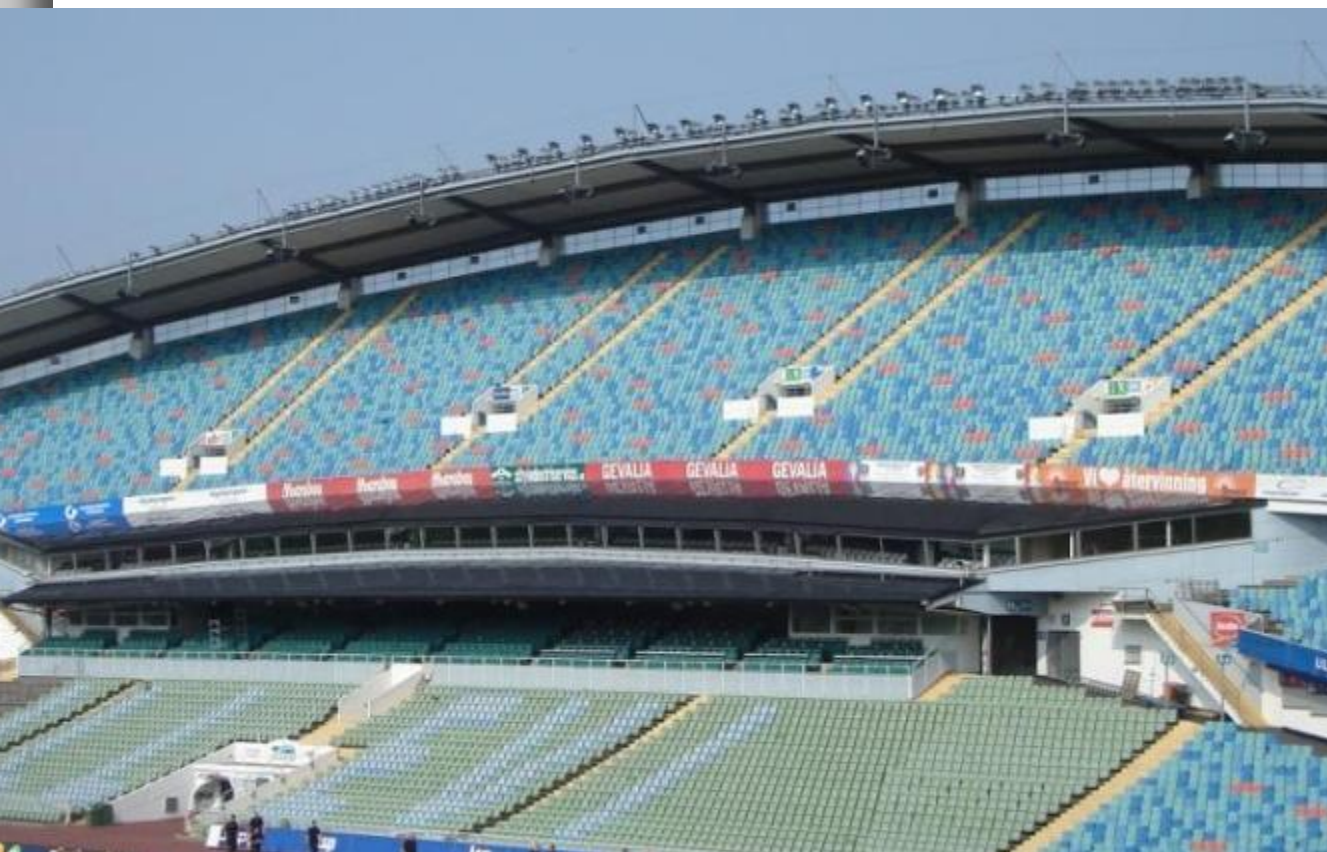


Analysis, Design & Supply of Turn-key Photovoltaic
Power Systems

Michiel van Noord

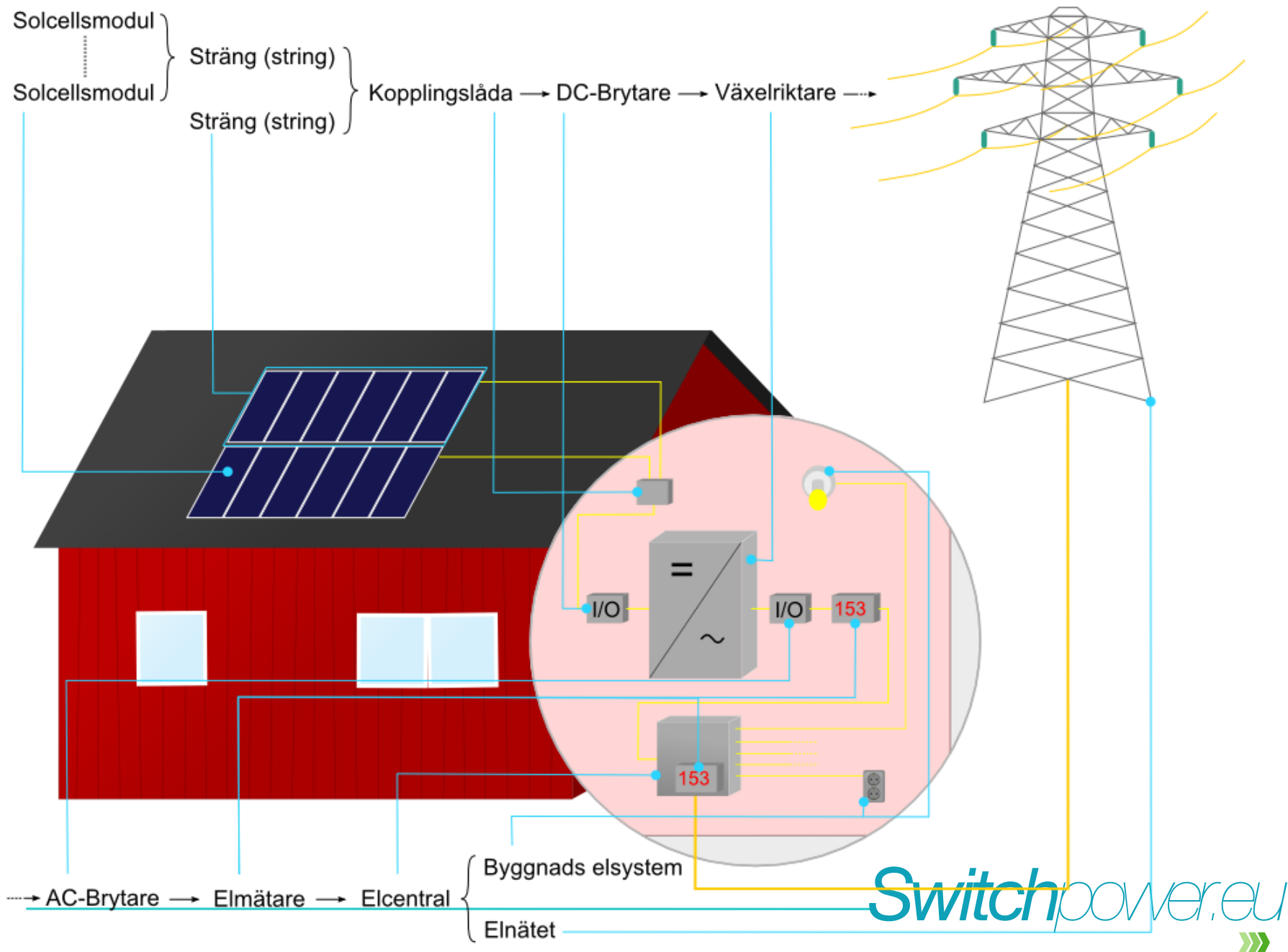




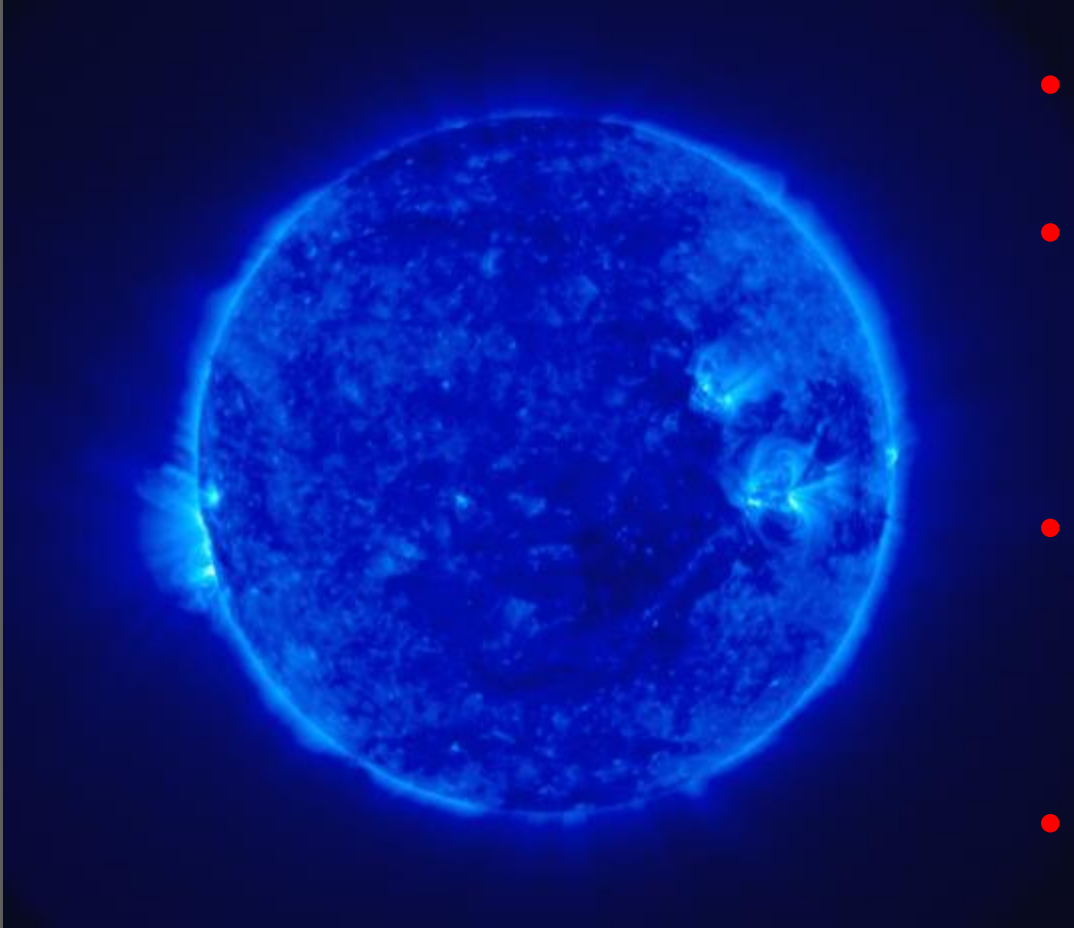








Hur ser en standard sol ut?



- Instrålning 1000 W/m²
- AM1.5 Solspektrum
- Celltemperatur 25°C
- Toppeffekt: kWp

Bild: NASA

Hur fungerar solceller i Sverige

Svensk klimat

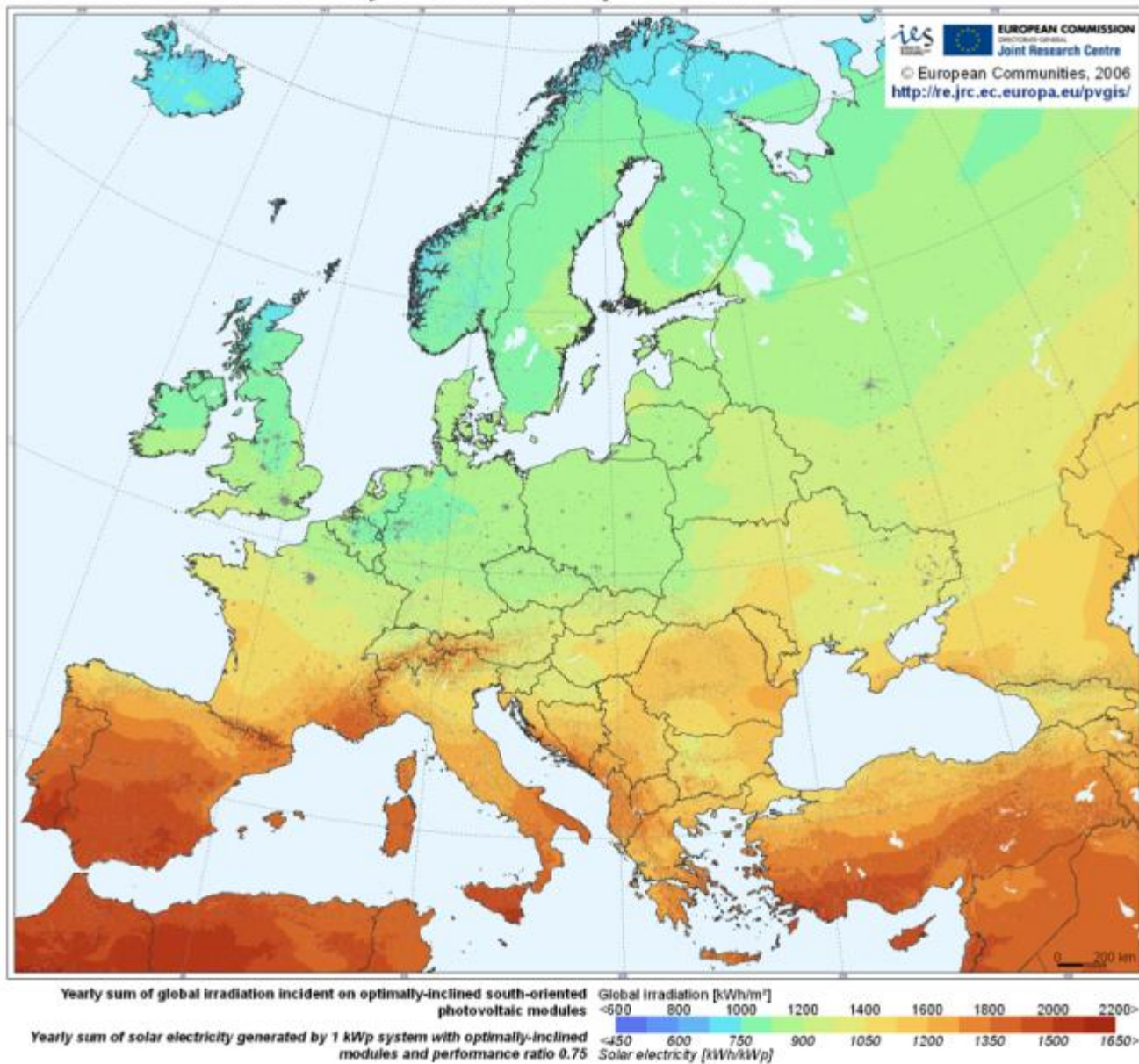
Pris och investeringskostnad

Sol i elmixen

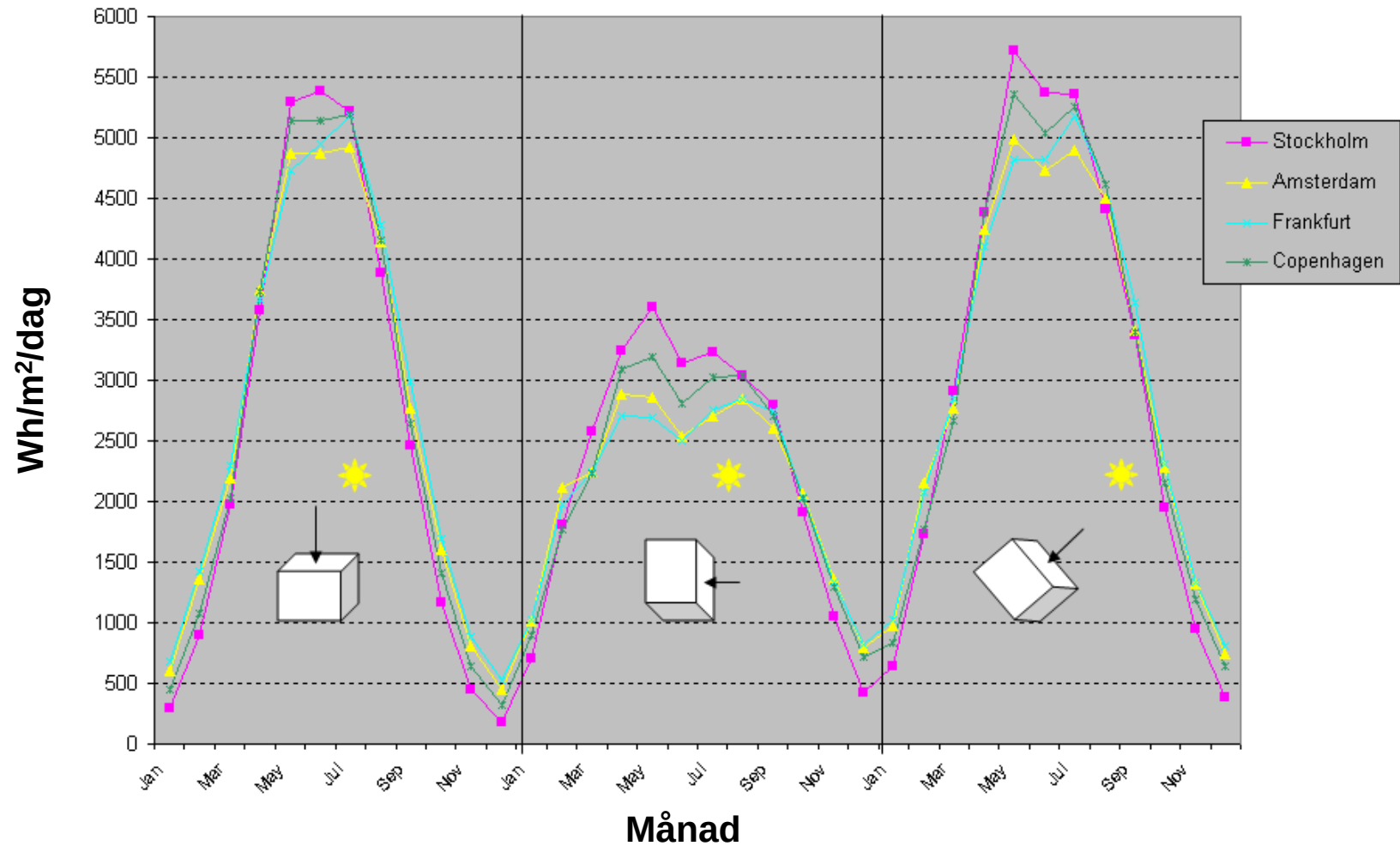
4TWh till 2020

Energiåterbetalningstid

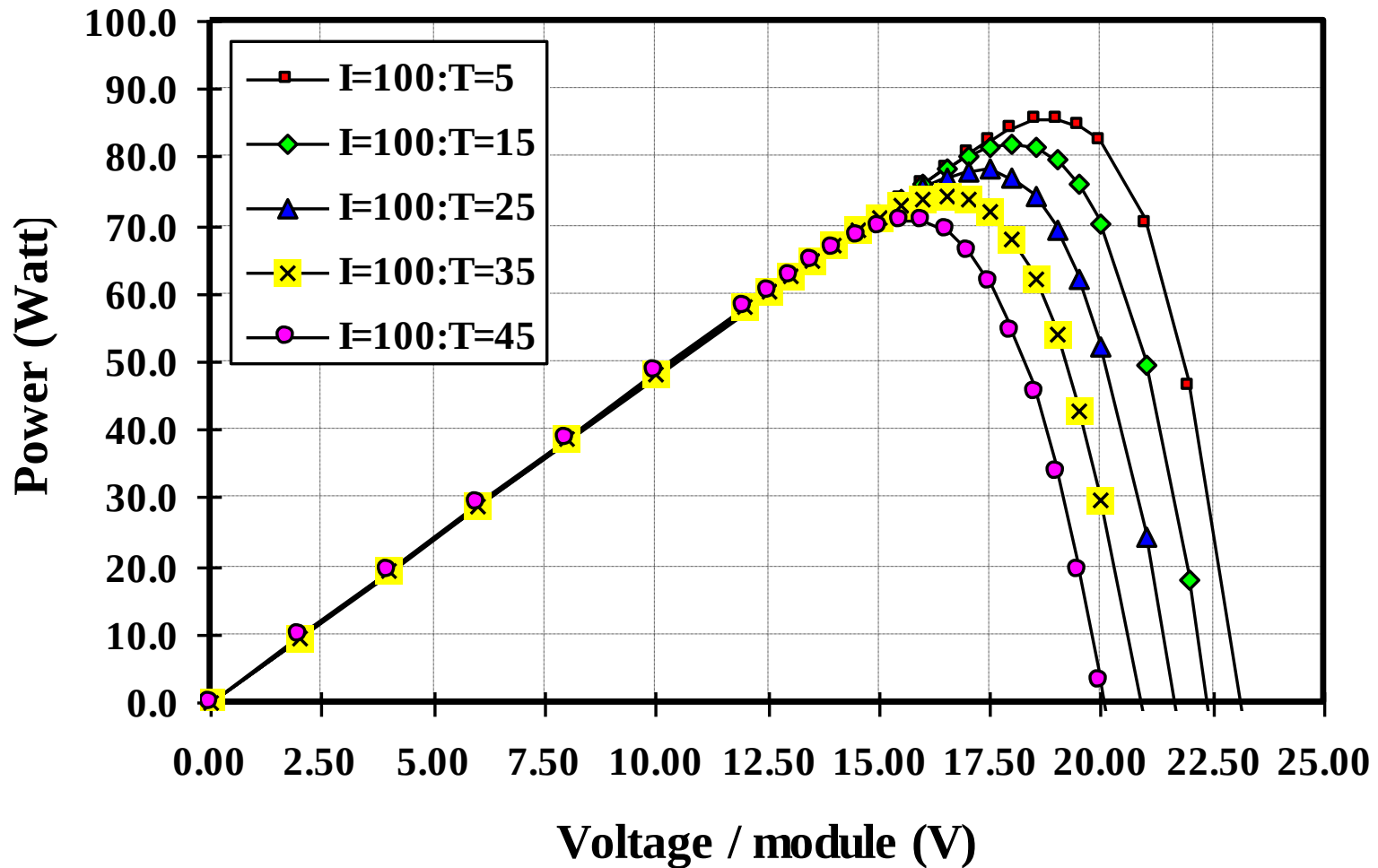
Photovoltaic Solar Electricity Potential in European Countries



Instrålning i norra Europa



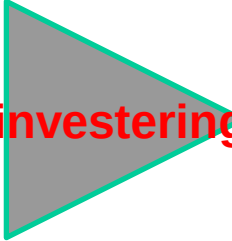
Temperatureffekten i solceller



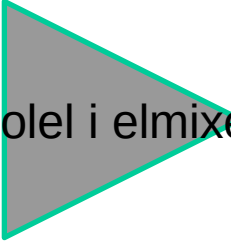
Hur fungerar solceller i Sverige



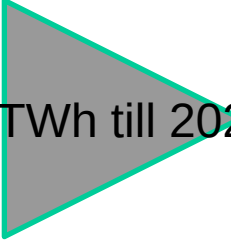
Svensk klimat



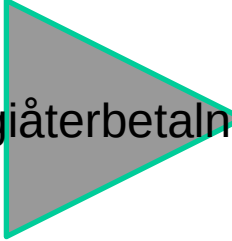
Pris och investeringskostnad



Sol i elmixen



4TWh till 2020



Energiåterbetalningstid

Investeringsstöd

- Max 2 miljoner kronor
- Max 75 kkr/kWp

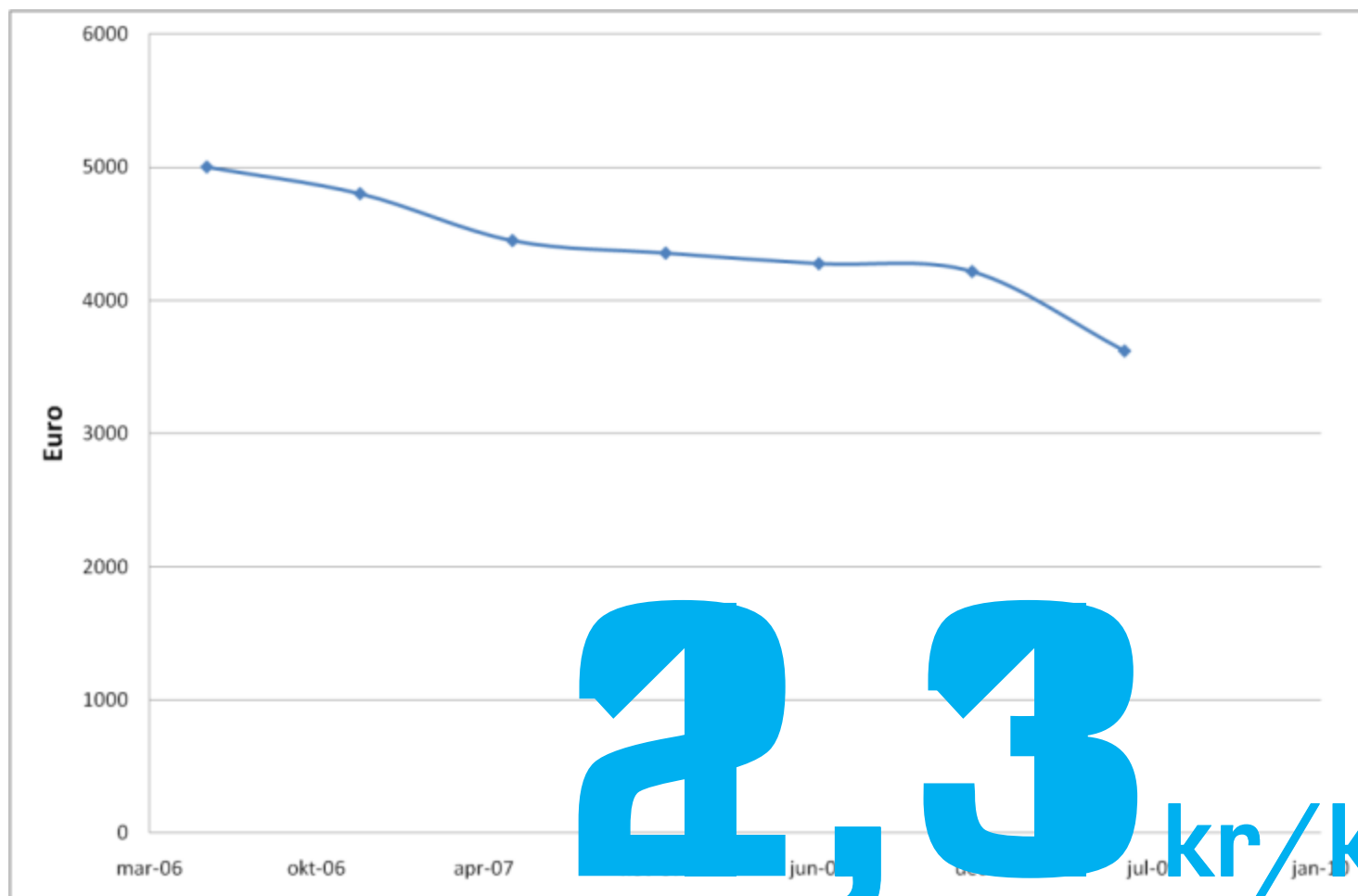
Privatpersoner, mindre bolag

60%

Större bolag

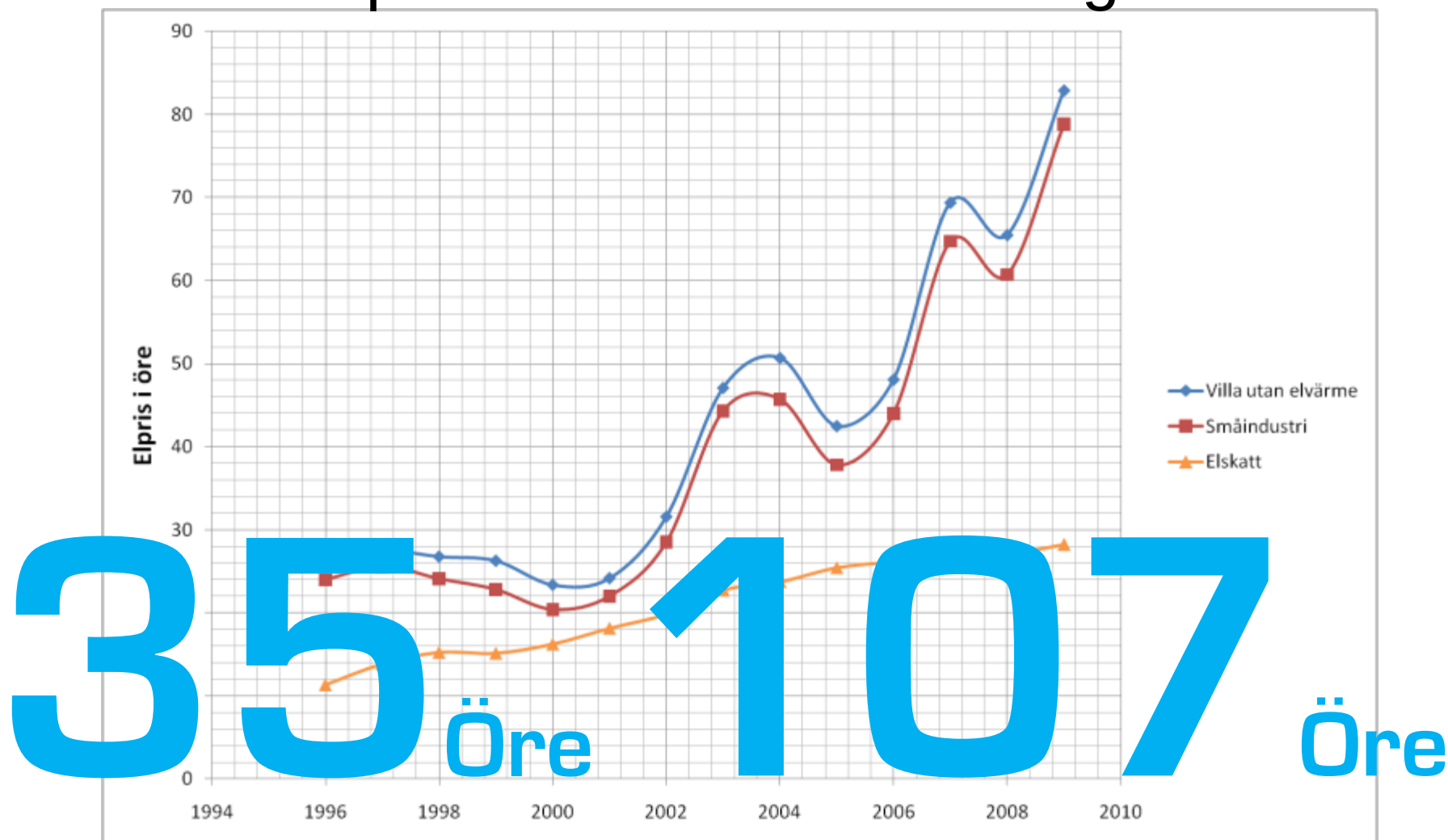
55%

Systempriser per kWp i Tyskland



Källa: BSW, 2009

Elpriser och -skatt i Sverige



Källa: SCB, Energimyndigheten, Svensk Energi 2009



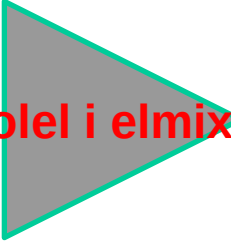
Hur fungerar solceller i Sverige



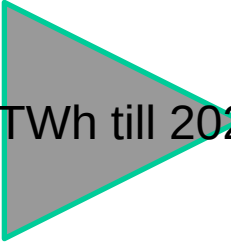
Svensk klimat



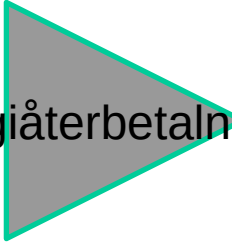
Pris och investeringskostnad



Sol i elmixen

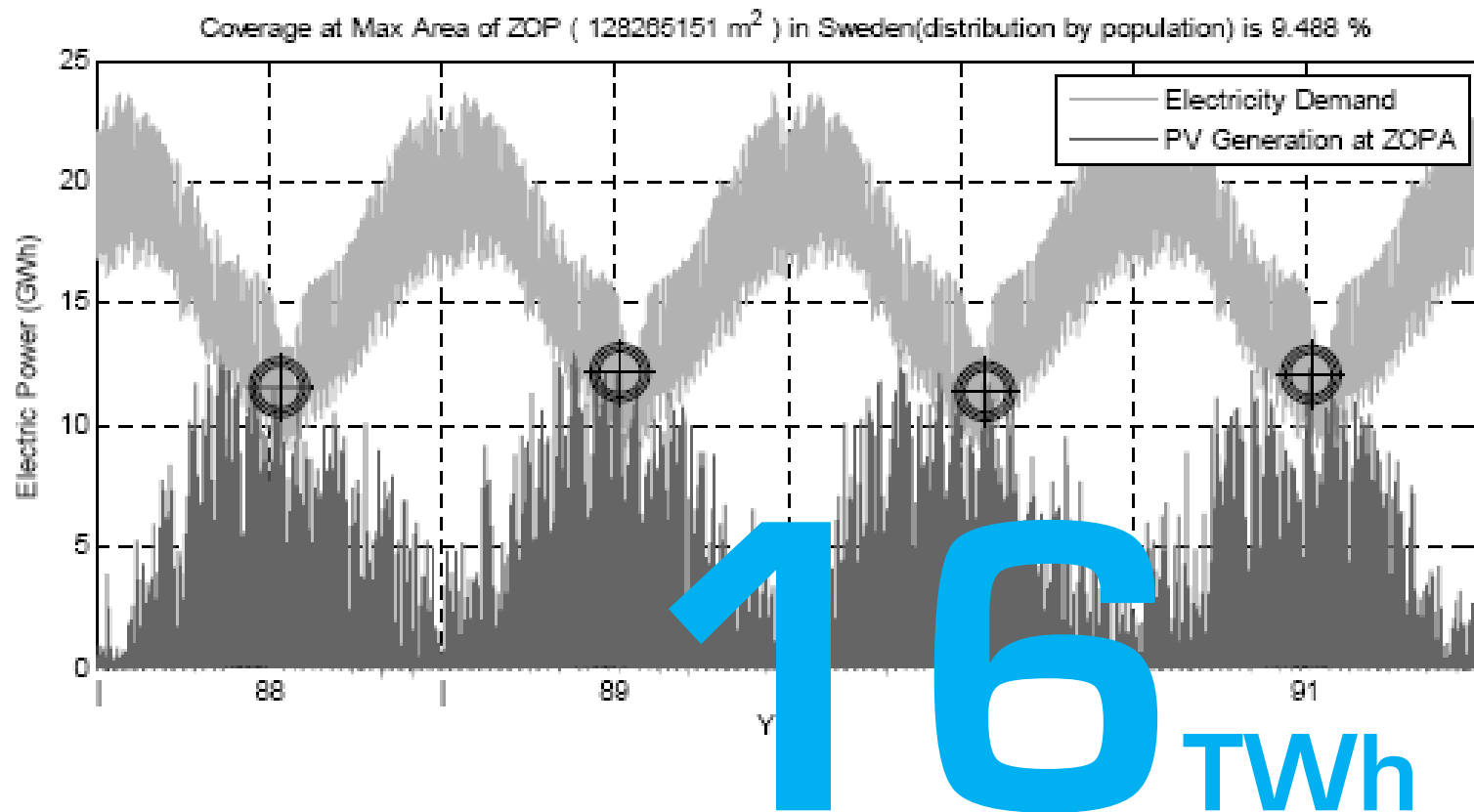


4TWh till 2020



Energiåterbetalningstid

Solel i elnätet



Källa: Elforsk, 2007

Vindutredning



Variation från **4** GW

vindkraft försvinner i
användningsvariation

*Switch*power.eu



Solel i elnätet - smarta nät

Smart house

Features digital meter, smart thermostat and other devices to allow customers to adjust their energy consumption according to preference and rates.

Solar panels: Excess power generated can be sent back to the grid.

Computer: Customers can go online to a Web portal to view real-time information about their power consumption or change their home energy settings.

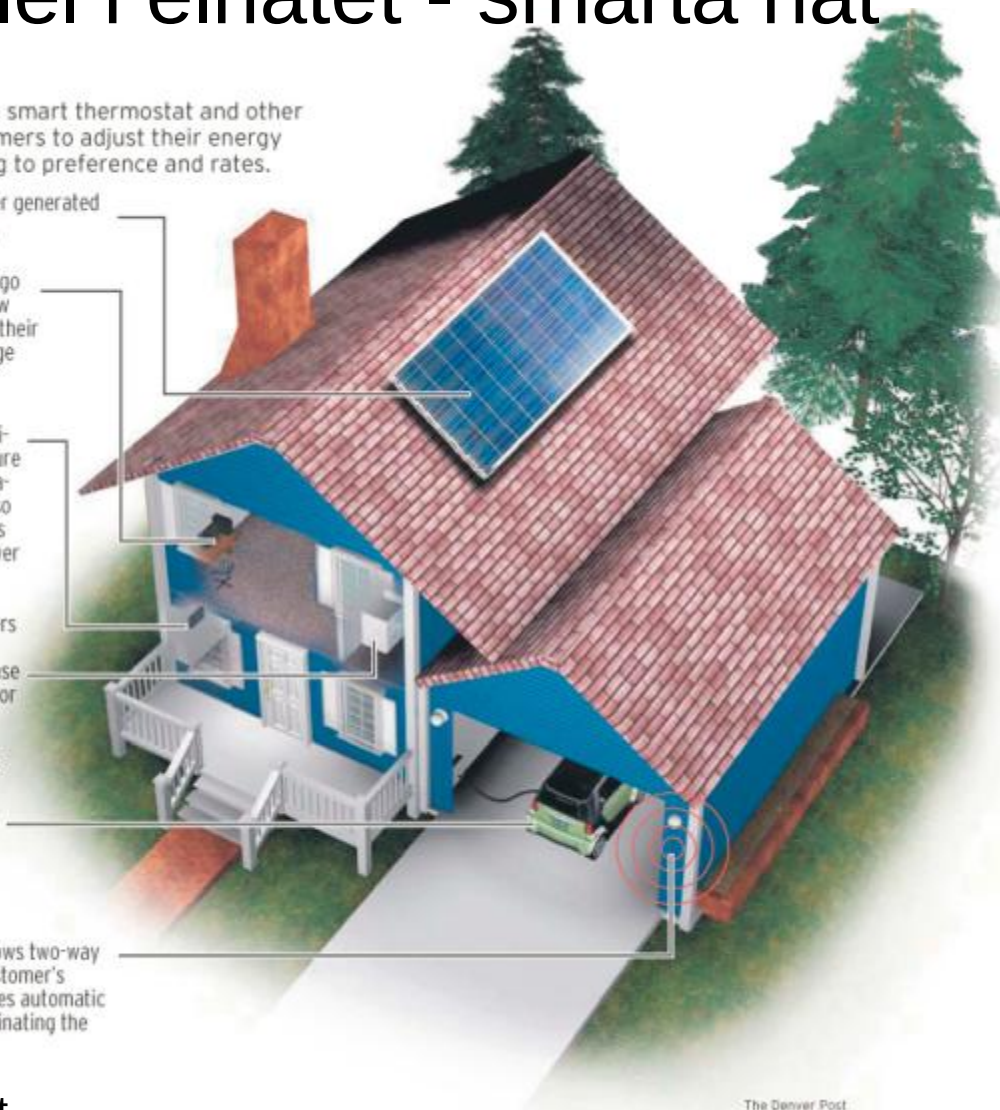
Thermostat: Can automatically adjust home temperature setting based on communication with power grid. Can also display how much customers are currently paying for power per kilowatt hour.

Smart appliances: Washers and dryers with on-board computer chips that can sense grid conditions and turn off or on as needed.

Electric plug-in vehicle:

Can act as a backup generator for homes and supplement the grid during peak hours, and charge in off-peak hours at lower cost.

Smart digital meter: Allows two-way communication between customer's home and the utility and gives automatic energy usage readings, eliminating the need for meter readers.



The Denver Post

Källa: Xcel, Denver Post

Switchpower.eu



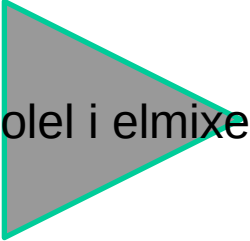
Hur fungerar solceller i Sverige



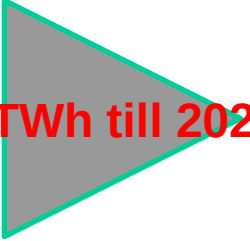
Svensk klimat



Pris och investeringskostnad



Sol i elmixen



4TWh till 2020



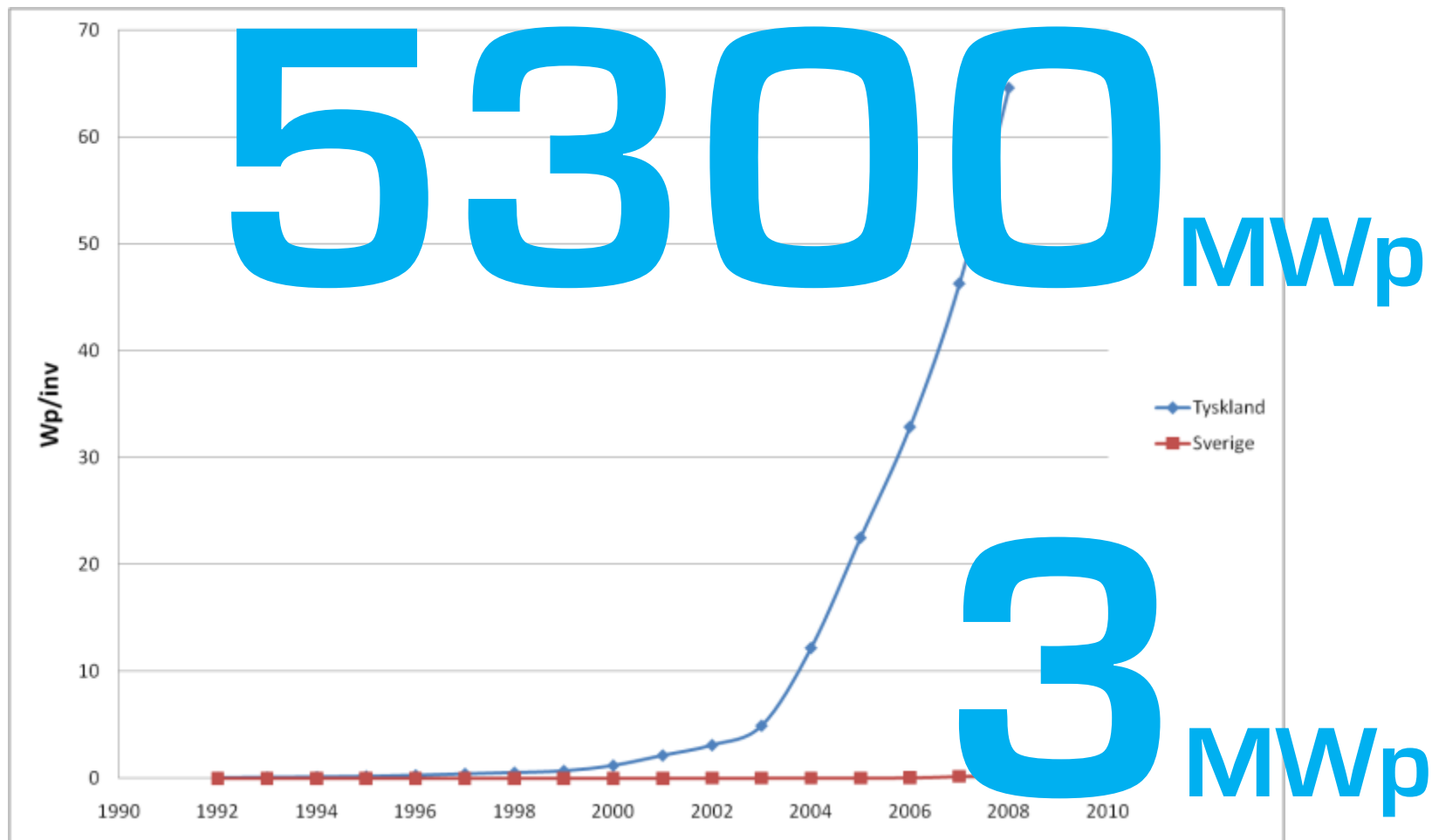
Energiåterbetalningstid

Solcellers potential

- 10 000 x mer instrålning än energiförbrukning
- Mest direkta form av förnyelsebar energi
- Halva Gotland » Hela Sverige
- 40% tillväxt per år
- 83% av svenskarna: satsa mer på solenergi

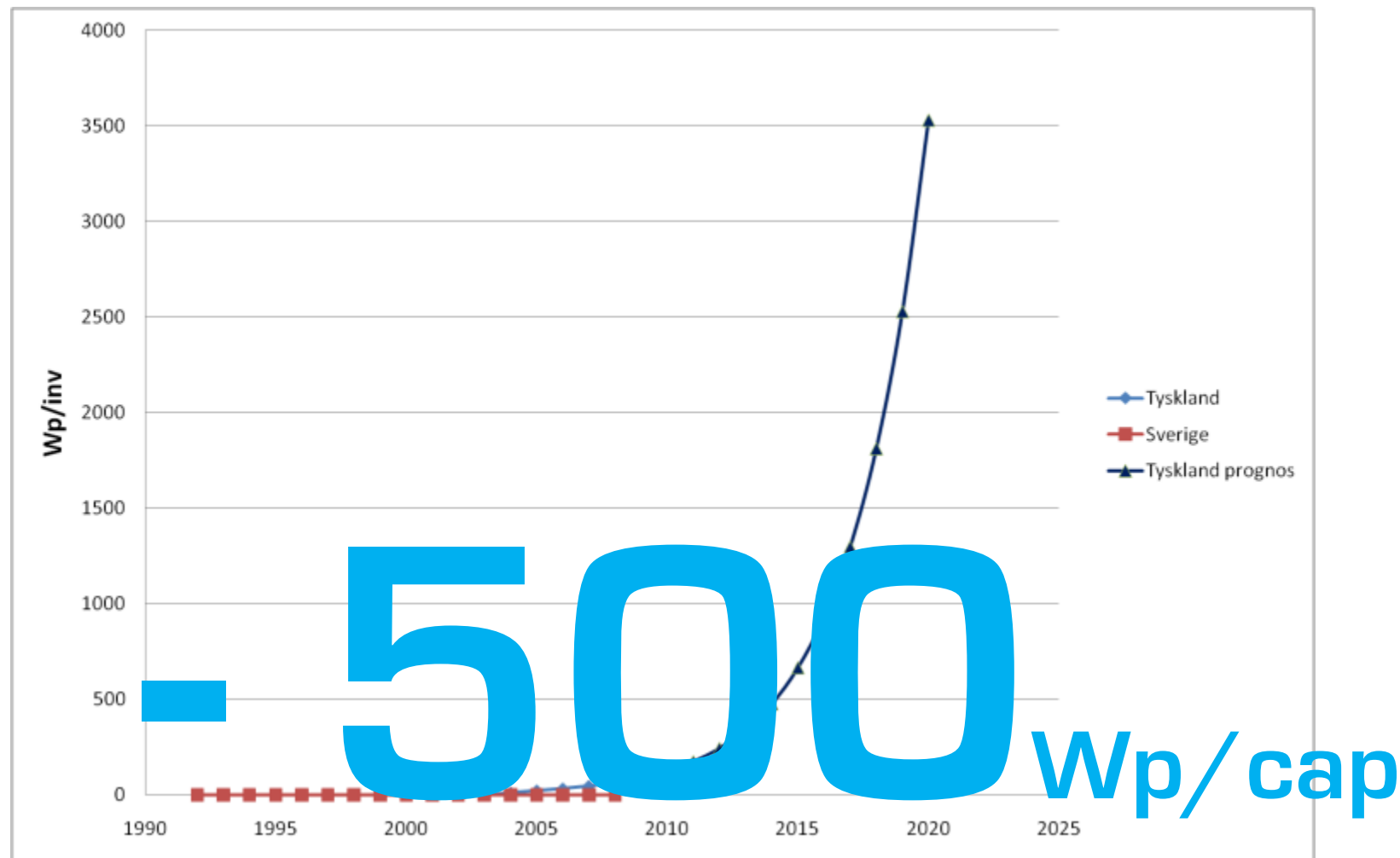


Installerad effekt per capita



Källa: IEA-PVPS, 2009

Installerad effekt per capita



Källa: IEA-PVPS, 2009; trend: MvN



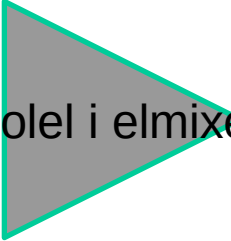
Hur fungerar solceller i Sverige



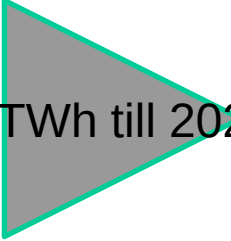
Svensk klimat



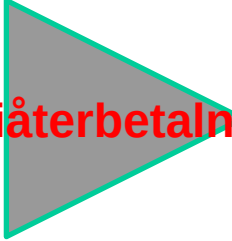
Pris och investeringskostnad



Sol i elmixen



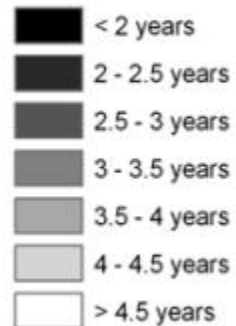
4TWh till 2020



Energiåterbetalningstid

Energiåterbetalningstid

Energy paybacktime



Källa: Jungbluth et al., 2008



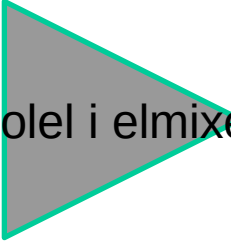
Hur fungerar solceller i Sverige



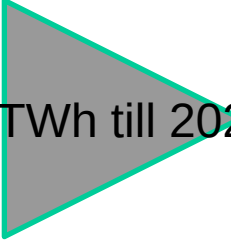
Svensk klimat



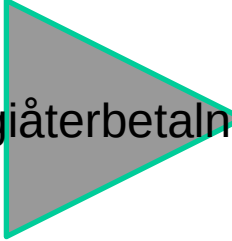
Pris och investeringskostnad



Sol i elmixen

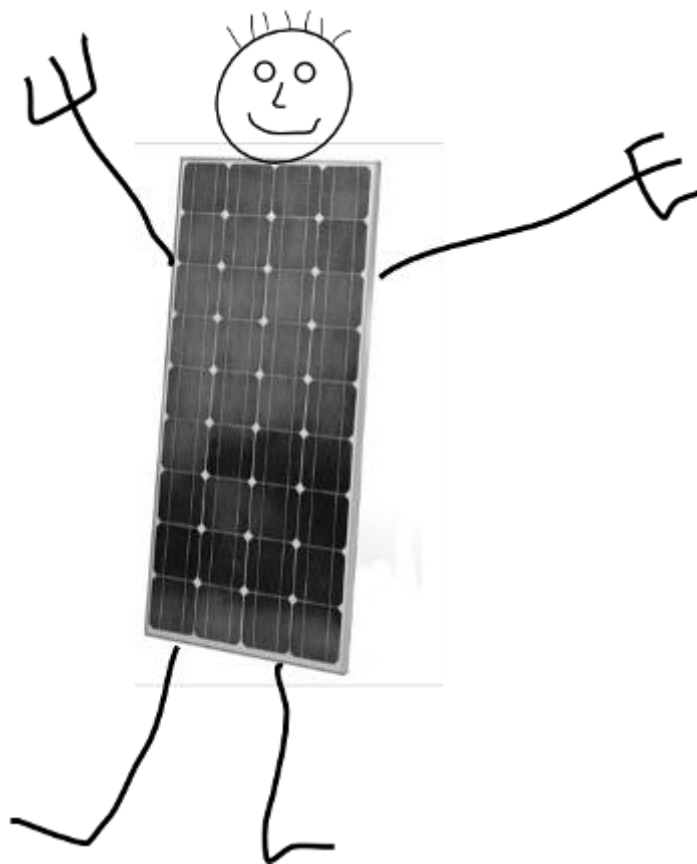


4TWh till 2020



Energiåterbetalningstid

Jag trivs i Sverige!





Analysis, Design & Supply of Turn-key Photovoltaic Power Systems

Switchpower

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