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International Conference on Renewable Energy Cooperatives 27th April 2022, Turkey

Danish Solar Concepts – Behind & in Front of the Electric Meter

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Sustainable Buildings and Cities Association; Ecological Building Association
Solar Lightning Consultants ApS & Solar Lightning Enterprise ApS

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 **VedvarendeEnergi**
København



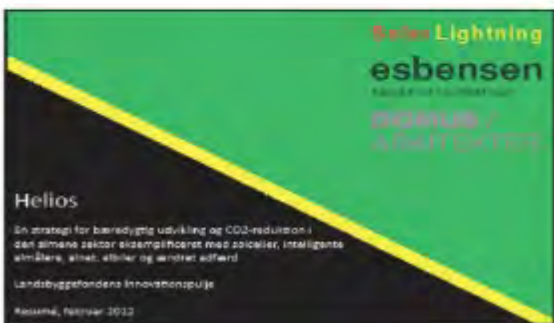
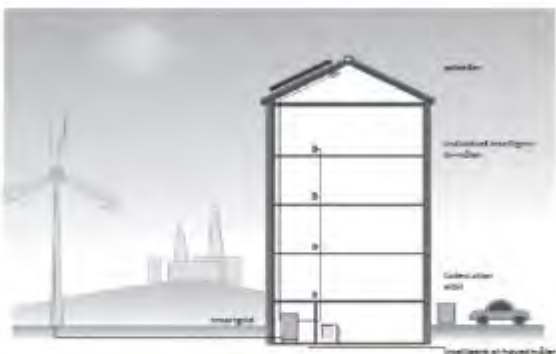
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Danish Solar Concepts – Behind & In Front of the Electric Meter

1. Helios Solar Model for social housing
2. Social Housing community Vendsysselhus
3. Housing community AB Landsdommergaarden
4. Housing community AB Amsterdamgaarden
5. European Union Directive – Danish law 889; Local Green system delivery - central EL grid
Energy Community Avedoere A.M.B.A. Hvidovre Solarcarport + EV chargers
Renewable production & Charge Point Operator; Open source charging for all citizens – APP/Visa
6. Batteries and EV chargers – EL Grid; Regulation- balance Day/night. Summer/winter.
7. Konklusions Hurdles Demands



1. Helios Solar Model – CO 2 Neutral Social Housing



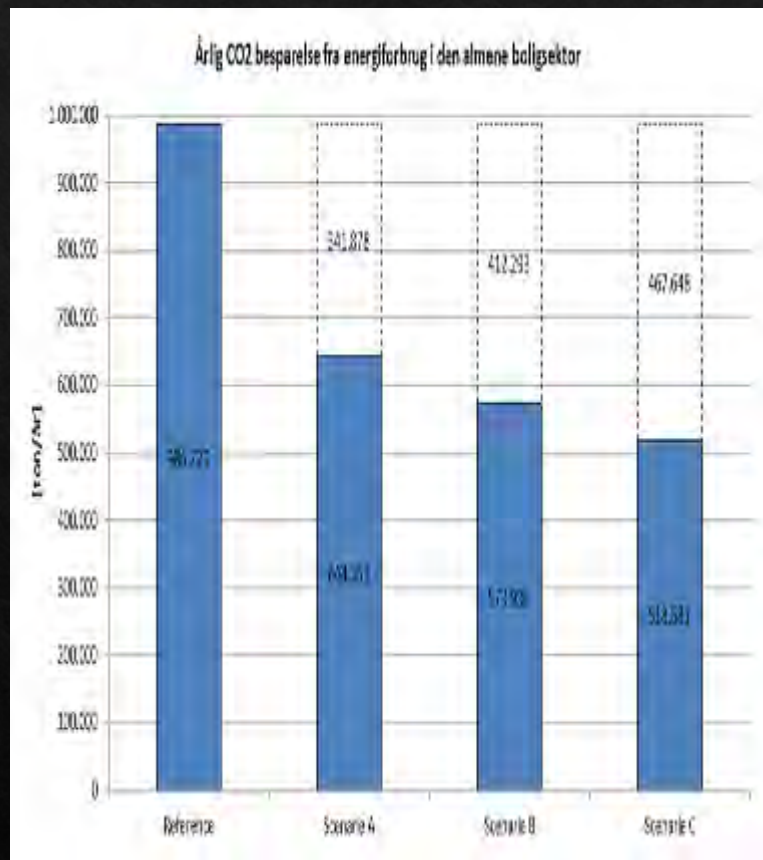
Helios Solar model developed in 2012 for Landsbyggefonden Innovation Foundation

Cooperative housing sector in Denmark

560.000 apartments - 1.1 mio. inhabitants

Plan for 365.000 CO2 Neutral social apartments

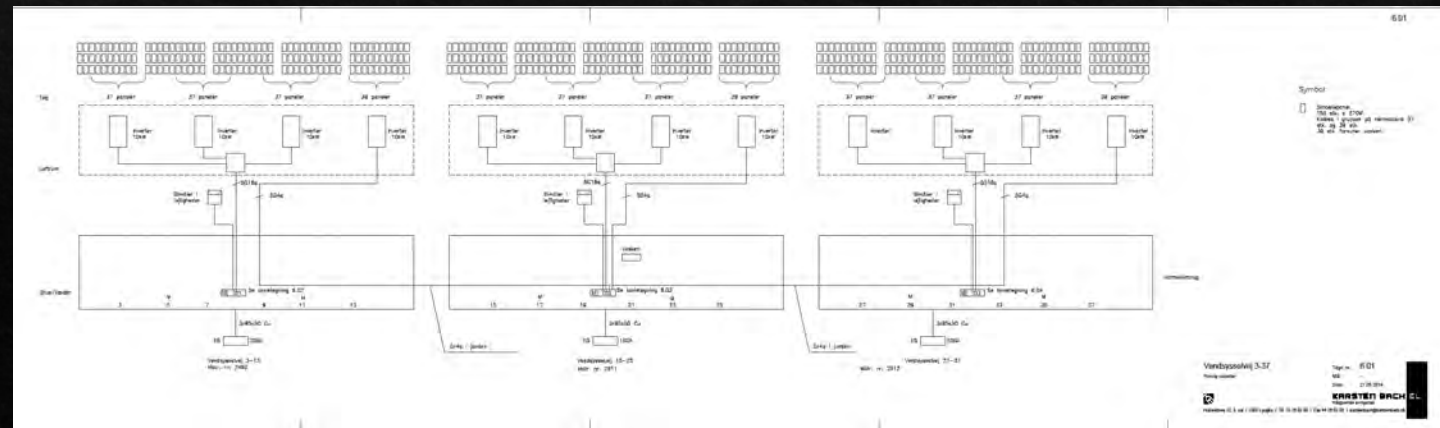
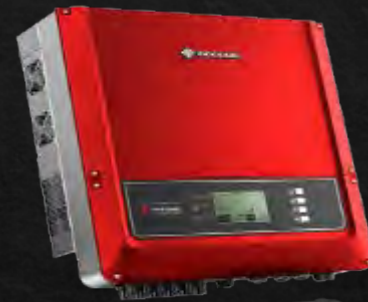
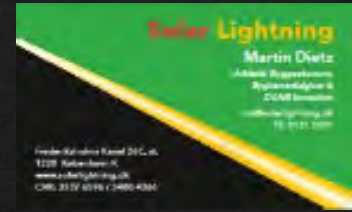
5,83 mio. inhabitants in Denmark.



**Different CO2 scenarios
35-47 % reduction**



2. Boligforeningen Vendsyssevej – Housing Community
 121,5 Kwh Solar cells Solar Future, 12 x 10 KW inverters
 99 Kamstrup secondary meters, 40 KW XOLTA batteries
 Reuse of rain water for washing machines, Energy windows
 Paperwool- & Silicat insulation



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3. AB Landsdommergaarden

52,25 kWp Red Solar BIPV cells in red tile roof

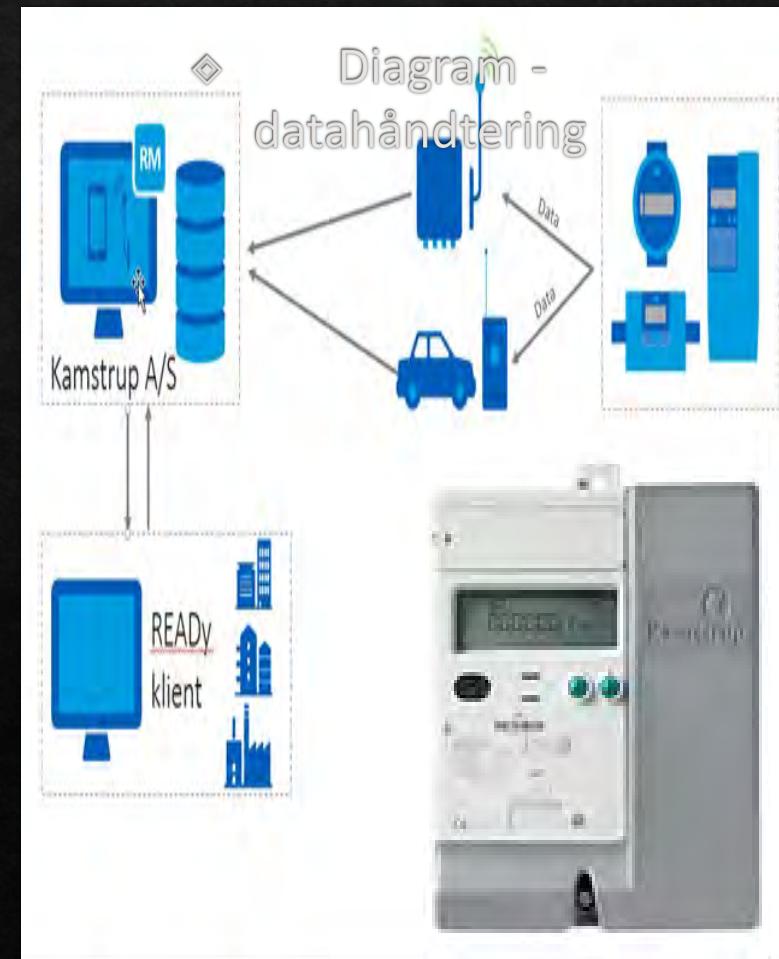
3 x 15 kW Inverters + 74 secondary meters + 10 KW XOLTA Battery





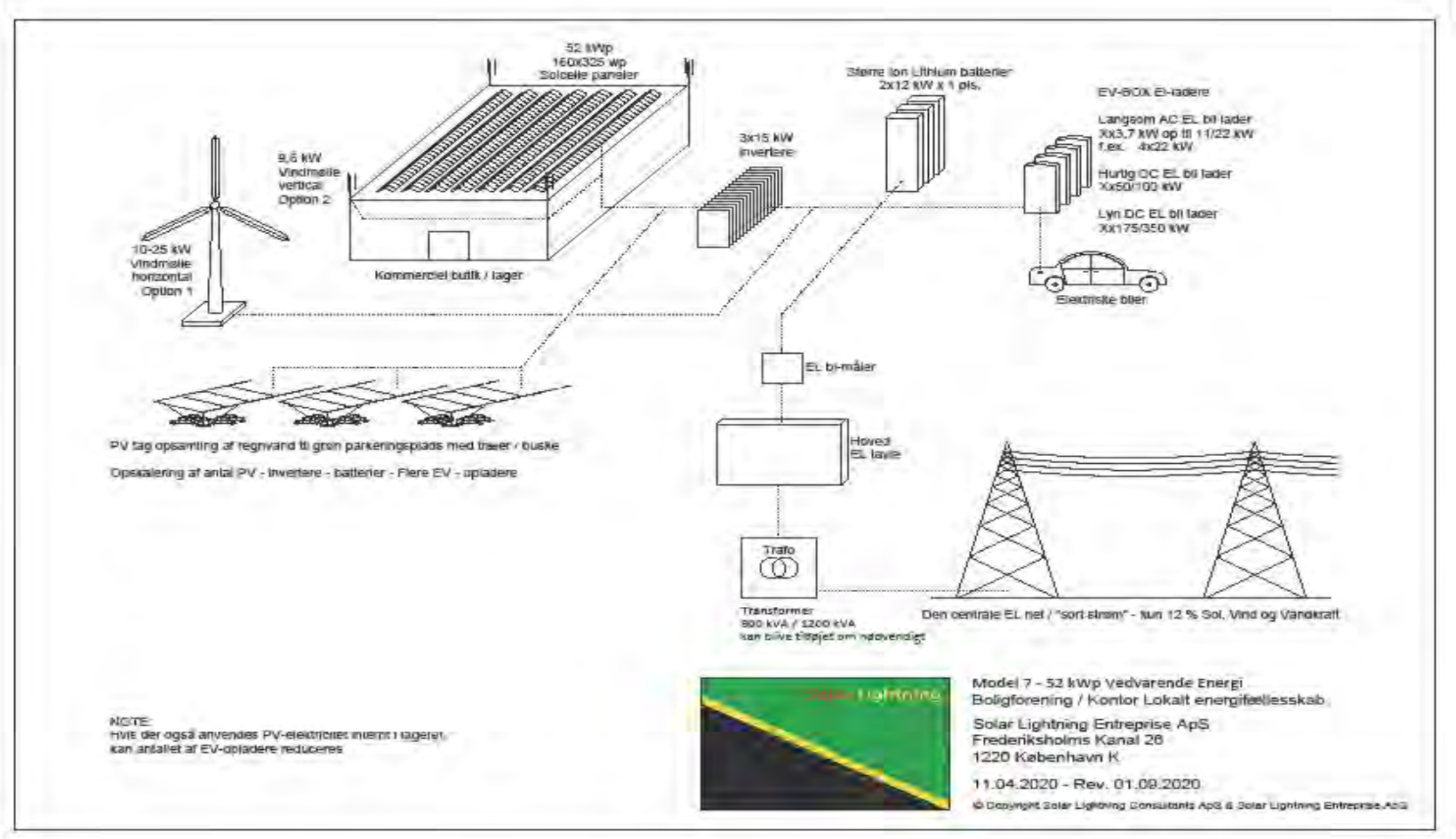
4. AB Amsterdamgaarden - Hørsholm

70 kWp . BIPV - 4 x15 kW Fronius inverters
42 Kamstrup secondary meters + 60 KW XOLTA batteries



5. Local Energy Community - EU Directive – Law 883

Local renewable Electricity – Pixi Diagram





11,88 kWp Solarcarport 4 P – pladser Demo project
2 x 22 KW EV BOX BL EV Chargers
Avedøre Energy Cooperative A.M.B.A, Hvidovre Gymnasium



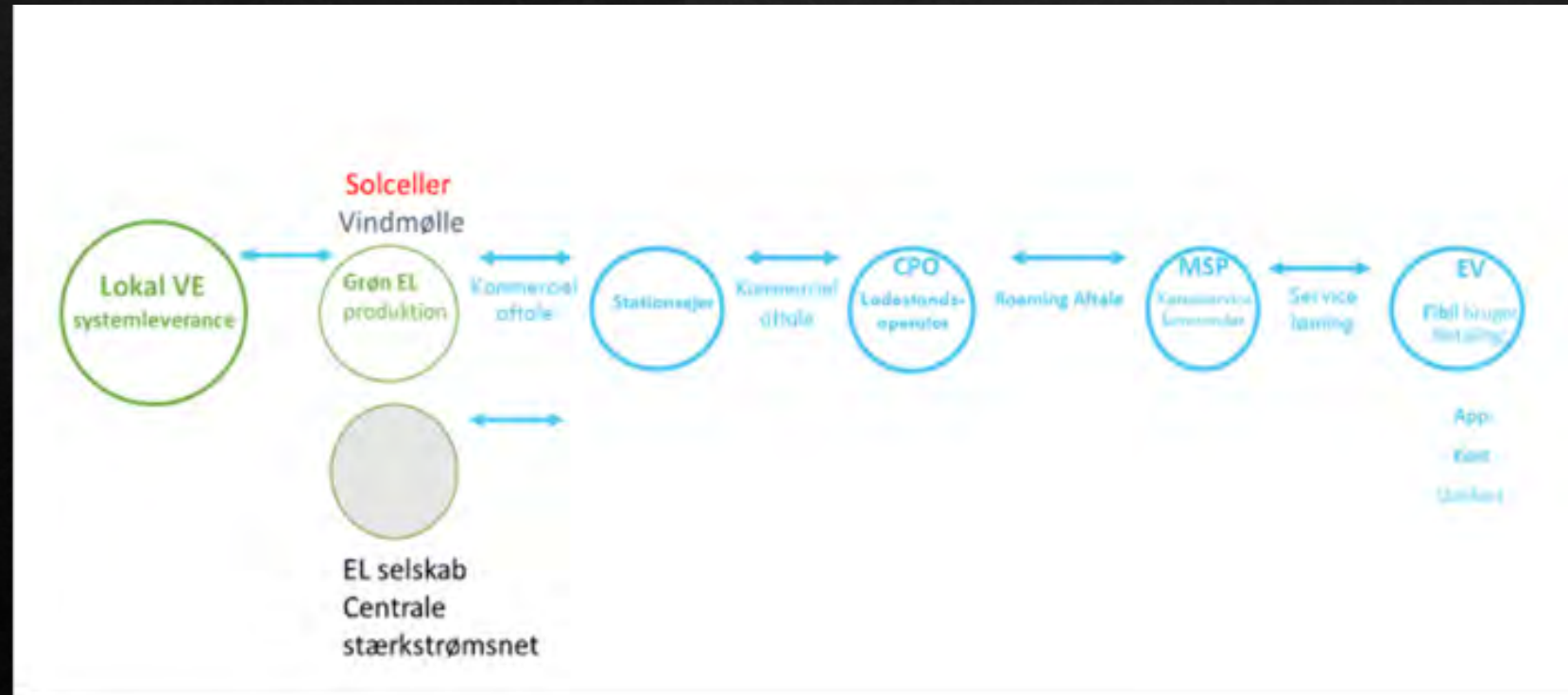


Renewable Energy and EV charging

Local Renewable system delivery – green local EL production
CPO, Charge Point Operator - MSP, Mobility Service Provider
Customer – Electric Vehicle – payment by APP / Visa card
Open source system – access for all citizens & companies

Avedoere Energy community A.M.B.A.
Founded 18. august 2020. Partners:

- Municipality of Hvidovre
- Heating company Avedoere
- Hvidovre Gymnasium & HF education
- Movie city area – Zentropa etc.
- Aveoere village – housing area
- EBO Consult ApS – REScoop.EU
- KAB apartments – cooperative team up
- 6.000 apartments – area 2 m2 miles
- Business models and financing , leasing etc.?



6. Future Technology Development - Frequency regulation - EL net balance
Nerve Smart system 600/300 KW battery or XOLTA 80+80+80 + 80 KW
Can be combined with EV Chargers, (slow, fast & rapid) & Local Energy Community



Preliminary design draft –
How it will look like ?





7. Observations, Conclusions, Hurdles & Demands

Renewable Energy Cooperatives locally means:

- ◇ Short distance from production, energy saving and consumption - reduce investment in central EL net
- ◇ EL cables crossing local cadastral boundaries is crucial!

A combined renewable strategy must be based on:

- ◇ A: In the cities: Solar installations on roofs and over parking places, combined with batteries and EV chargers, heat pumps, biomass & Local small windmills on land
- ◇ B: Central big windmills in the sea & Solarparks on in fields

- ◇ Denmark made a minimum implementation of EU Renewable Energy Directive (REDII) into Law 889 - 2021
- ◇ Maximum REDII implementation is necessary ! – attachment to Law 889 or new REDII/ law in 2023 !
- ◇ Business Plans and financial models, risk and security / SWAT analysis must be made before start a RED Energy community with fase plan for action and development!
- ◇ Guaranties granted by the state / municipalities for projects

Thanks You



Read about us - INFORSE-Europe's web site

www.inforse.org/europe



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The Power of the Community Energy - Erasmus+ Project in 2019-22

https://www.inforse.org/europe/POWER_CE.htm