



CYPRUS UNIVERSITY OF TECHNOLOGY
Sustainable Energy Laboratory

Net Metering

A Nearly-Zero and Zero-Net Energy Building Policy implemented in Cyprus

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Presentation Structure

- ▶ **Introduction**
- ▶ Net Metering Scheme
- ▶ Economic analysis
- ▶ Market Research
- ▶ Conclusions



Introduction

Electricity generation

▶ Cyprus

- Eastern Mediterranean, 35.2N, 33.4E
- Population: 800.000 people
- Energy-isolated island
- No electricity interconnection or pipelines to other countries

▶ Electricity Generation Mix

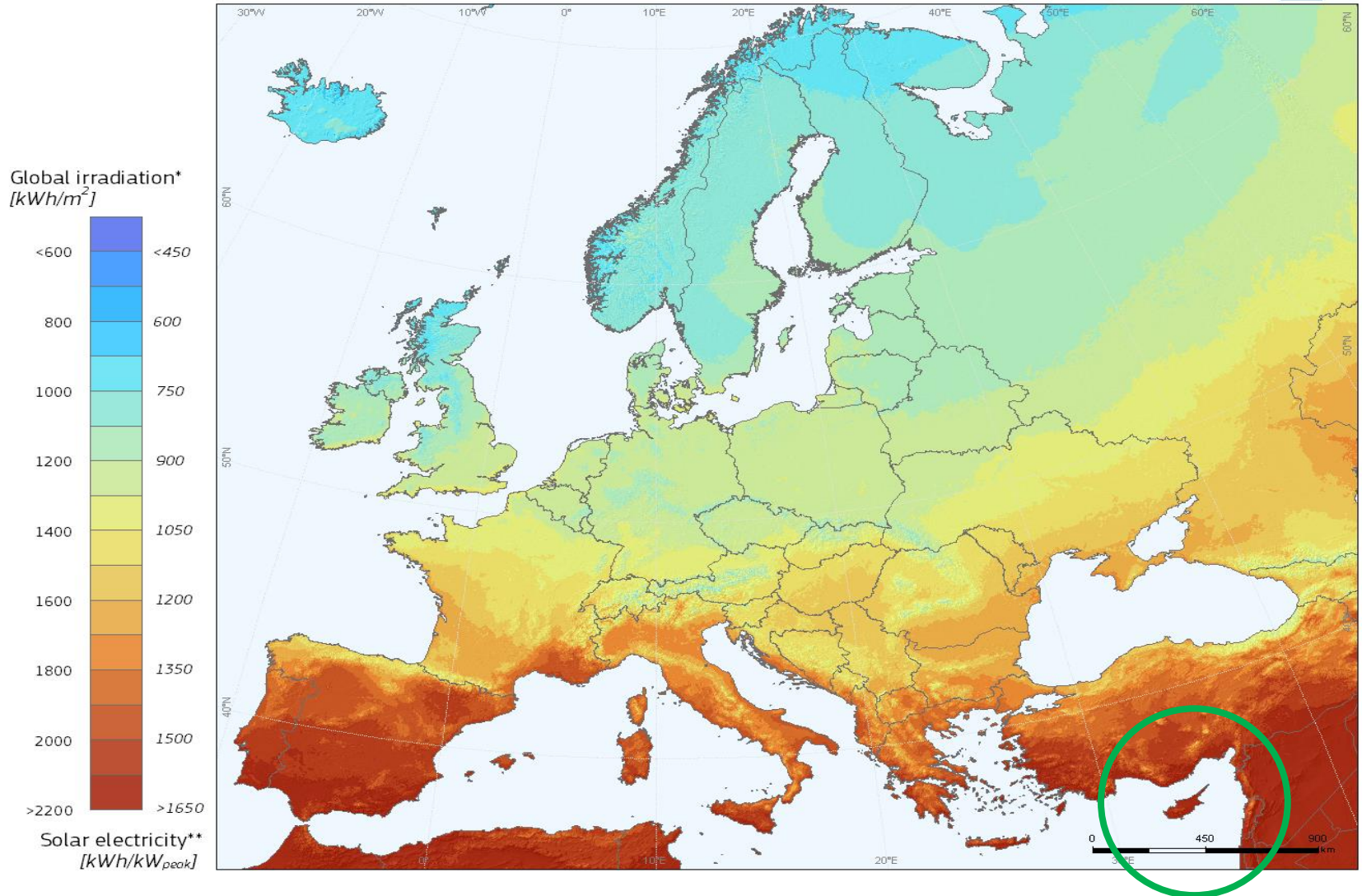
- Fossil Fuel thermal plants: 92.7%
- Wind turbines: 5.4%
- Photovoltaics: 1.1%
- Biomass: 0.8%

▶ Currently no energy storage



Introduction

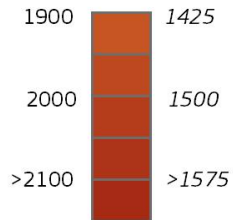
Solar Irradiance Potential



▶ Annual PV yield : >1700kWh/kWp

- Uniform

Yearly sum of global irradiation
[kWh/m²]



Yearly sum of solar electricity
generated by 1kW_p system
with performance ratio 0.75

[kWh/kW_{peak}]

 Urban area





- ▶ Current Legislation for all new buildings
 - Must be at least “Category B”
 - Must install solar thermal system for domestic hot water
 - Must have provision for installing renewable energy systems
- ▶ Rooftop PVs: 3kWp limitation per residence
- ▶ Legislation after 2020
 - 2020: All new public buildings must be near zero energy buildings
 - 2022: All new buildings must be near zero energy buildings
- ▶ How to achieve Near Zero Energy Buildings
 - Rooftop Photovoltaics -> Net-Metering
 - Energy trading with ESCOs



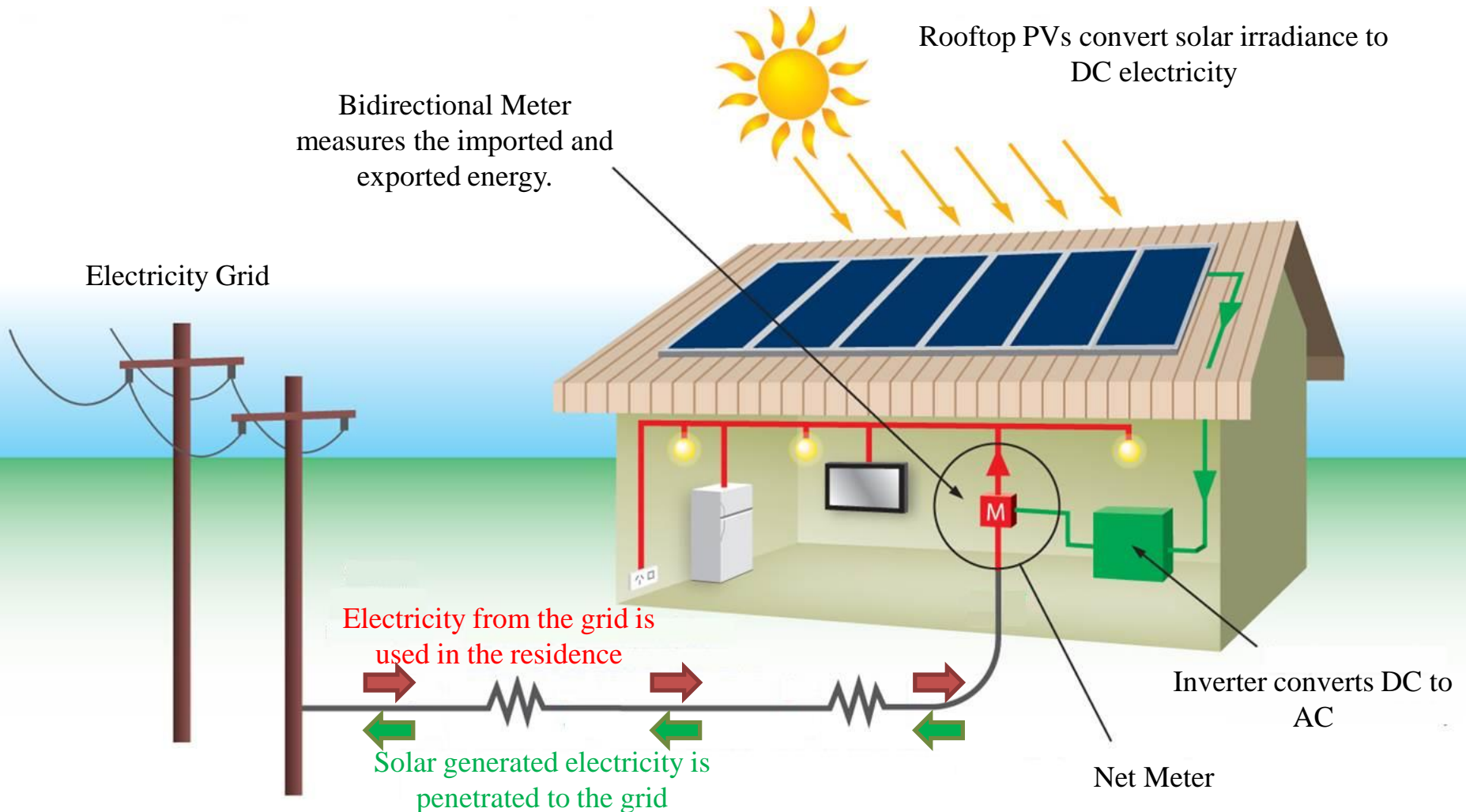
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Net Metering Scheme

What is Net Metering?





Net Metering Scheme

The case of Cyprus

▶ Size Limitation

- 3kWp per residence
- Systems should be installed on the roof or nearby the residence

▶ Eligible only for residential buildings

- Commercial buildings are under the self-consumption scheme

▶ Production – consumption compensation

- Bimonthly billing periods
- If the net is positive the consumer pays the difference
- If the net is negative, the consumer earns the net amount as credit
- Credits are transferred to the next bill but are erased after the end of a billing year



Net Metering Scheme

Data in Cyprus

▶ Scheme initiated in 2013

- Limited bureaucracy
- **7237 Systems installed** (May 2015)
- Most systems are 3kWp
- Aiming for 60,000 systems by 2016

▶ Capital Cost

- ~€1500 per kWp (plus 19% VAT)
- **€5355 for a 3kW system**
- Subsidy only for low income families (€900 per kWp)
- Annual grid cost: €56 per installed kWp

▶ Annual yield

- **>5000kWh** for a 3kW system



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Economic Analysis

Economics in Cyprus

- Capital Cost for a 3kW system: €5355
- Annual yield for a 3kW system: 5000kWh
- Electricity Cost (after taxes): €0,25/kWh

A/A	Scenario Description	Consumption kwh	Consumption €	Capital cost €	Pay back period
1	Old House (before2000)	8000	2000	0	-
2	Old House + PV	3000	750 +170	5355	5 years
3	New House (after 2011)	4000	1000	0	-
4	New House + PV	0 (-1000)	170	5355	6,5 years



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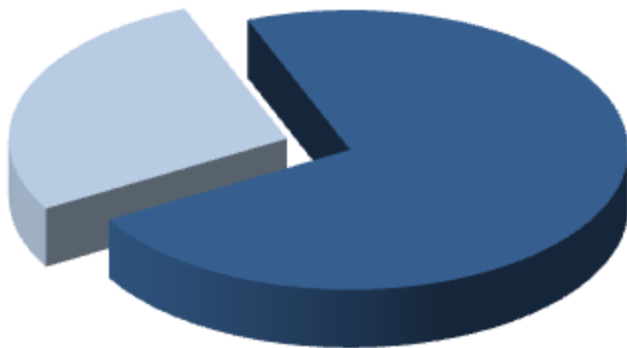


Market Research

Economics in Cyprus

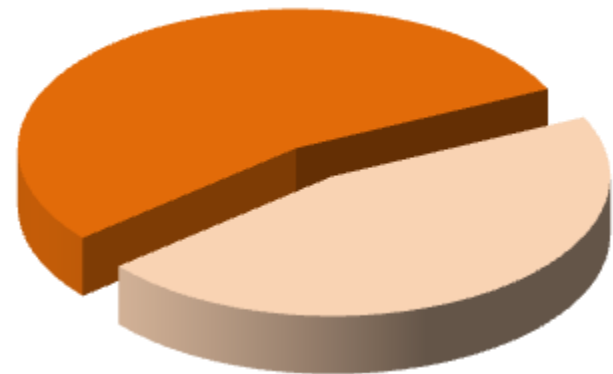
- ▶ A market research was performed to Net-Metering users
 - All systems were 3kWp
 - All satisfied (or very satisfied) by the scheme and by the installers
 - All installed the system for economic reasons and to save energy

Subsidy



■ low income (granted) ■ Not granted

Energy Certificates



■ Not aware ■ Aware

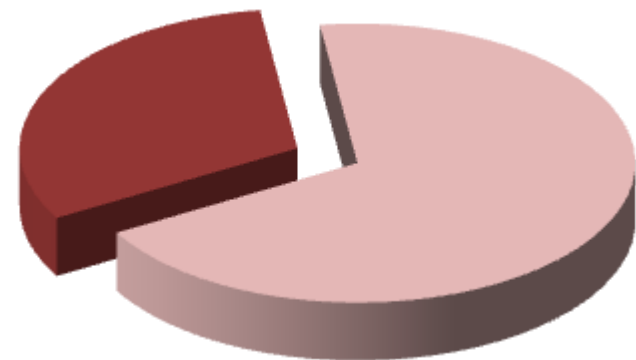
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Awareness for system



■ Check the report daily ■ Rarer checks

Consumption



■ increased ■ Not changed



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Conclusions

- ▶ Net Metering scheme in Cyprus
 - Initiated in 2013
 - Annual yield >5000kWh per system
 - Scheme is successful and will be continued
- ▶ Cost
 - ~€5355 for a 3kW system
 - New buildings → Zero Net Energy buildings
 - Cost approximately 1.5% of the capital cost of the house
- ▶ Zero ~~Net~~ Energy Buildings???
 - Waiting for Elon Musk for his batteries



End of Presentation

THANK YOU FOR YOUR ATTENTION

Questions?

For Further Information

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