Potential and trends of solar harnessing in the Nordic-Baltic region

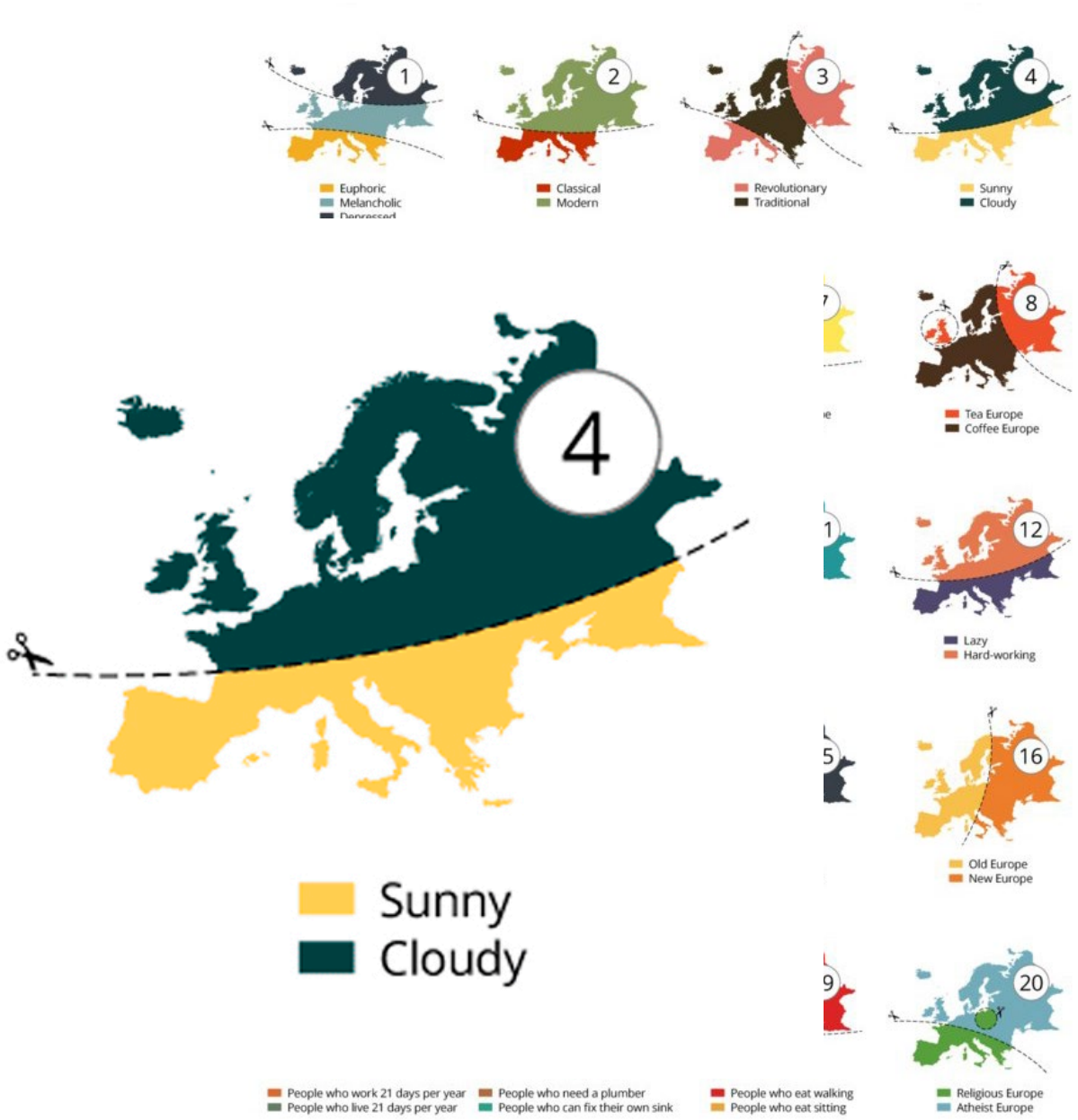
Andres Meesak

Estonian PV Association

20 WAYS TO BREAK EUROPE

by
Yanko Tsvetkov
Atlas of Prejudice

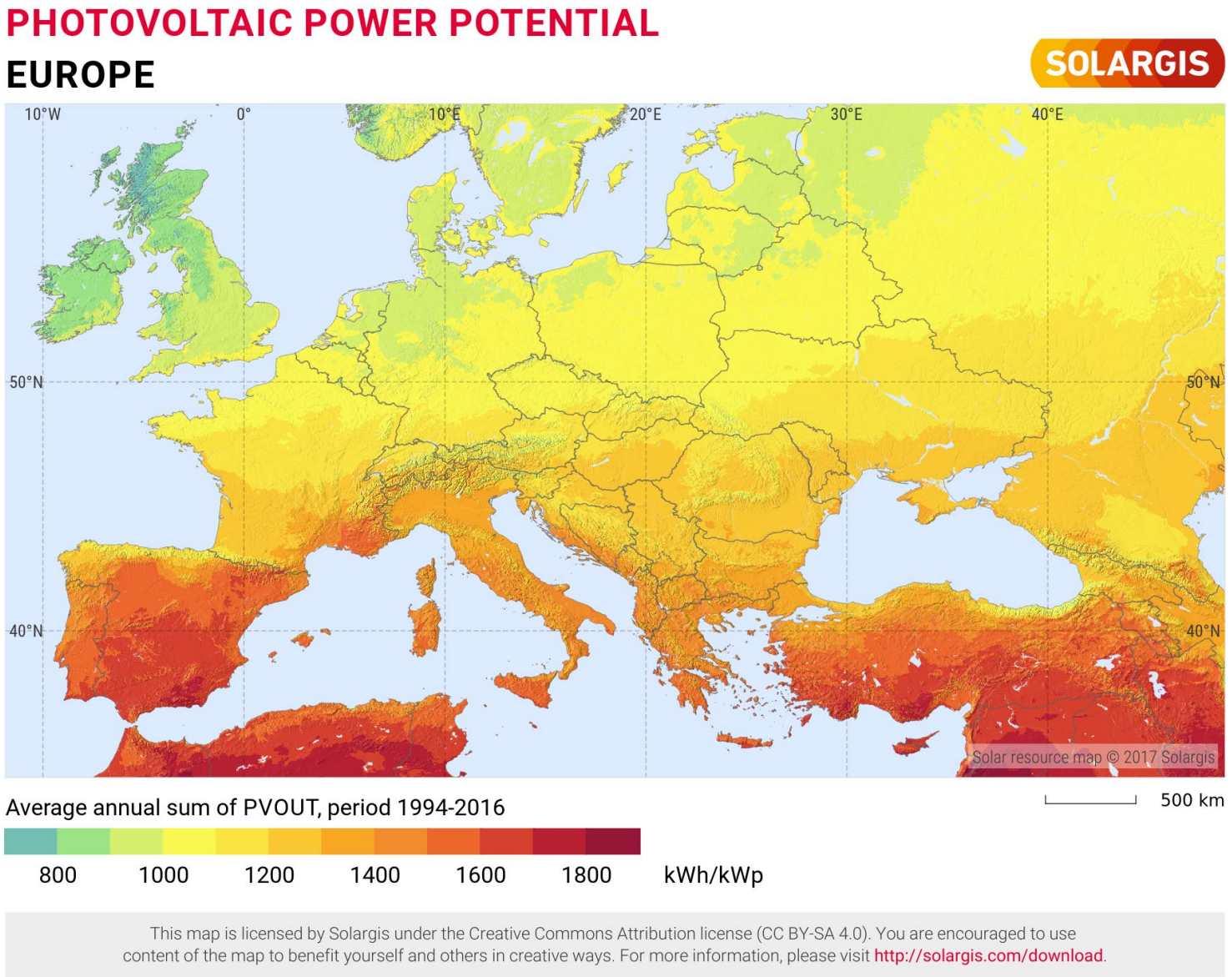
EPEA



Irradiation vs. PV potential

Irradiation:
Estonia 900 … 1100 kWh/m²
South Spain 1800…2000 kWh/m²

PV potential:
Estonia 1000 … 1100 kWh/kWp
South Spain 1500 … 1700 kWh/kWp



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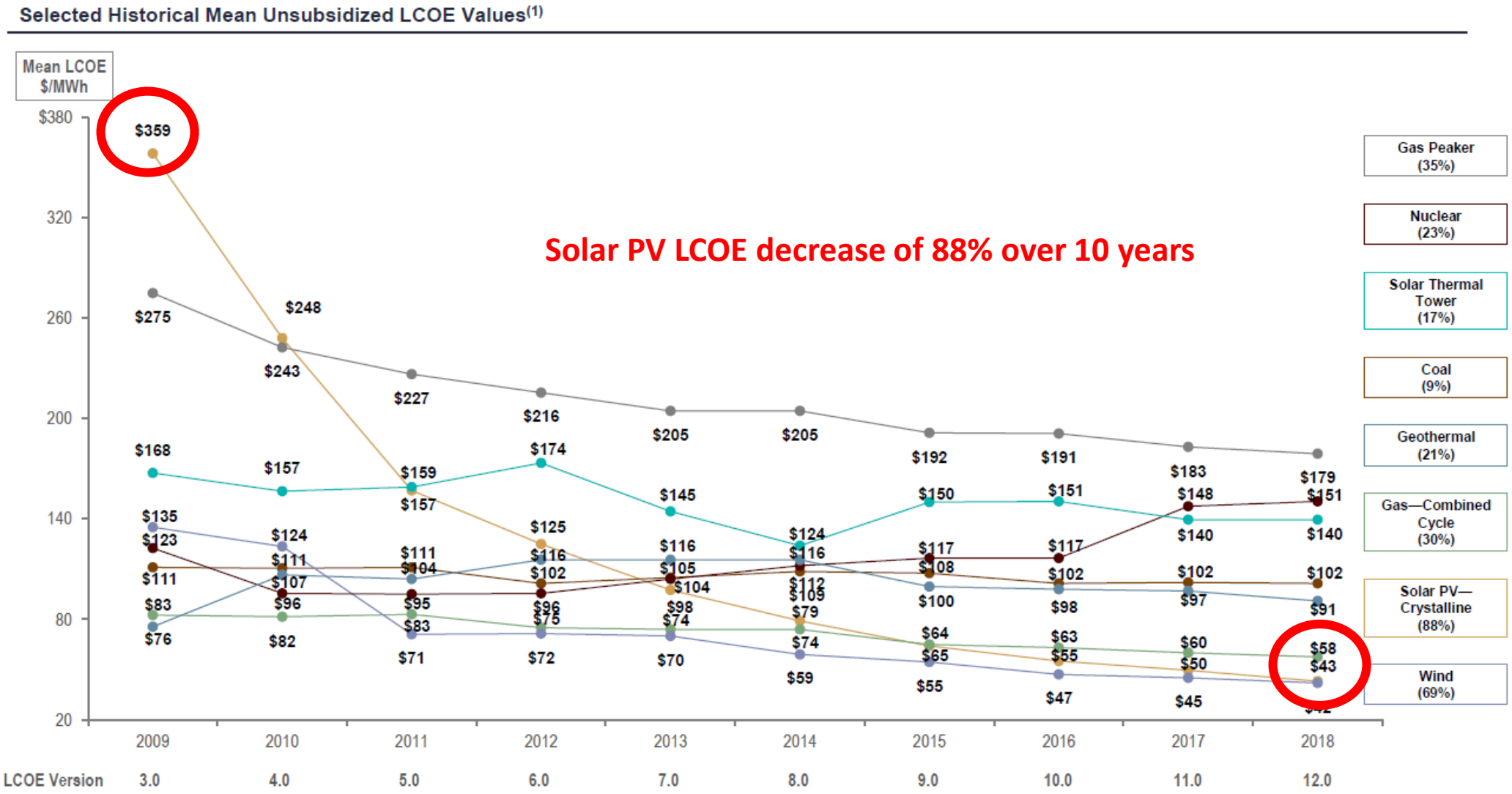
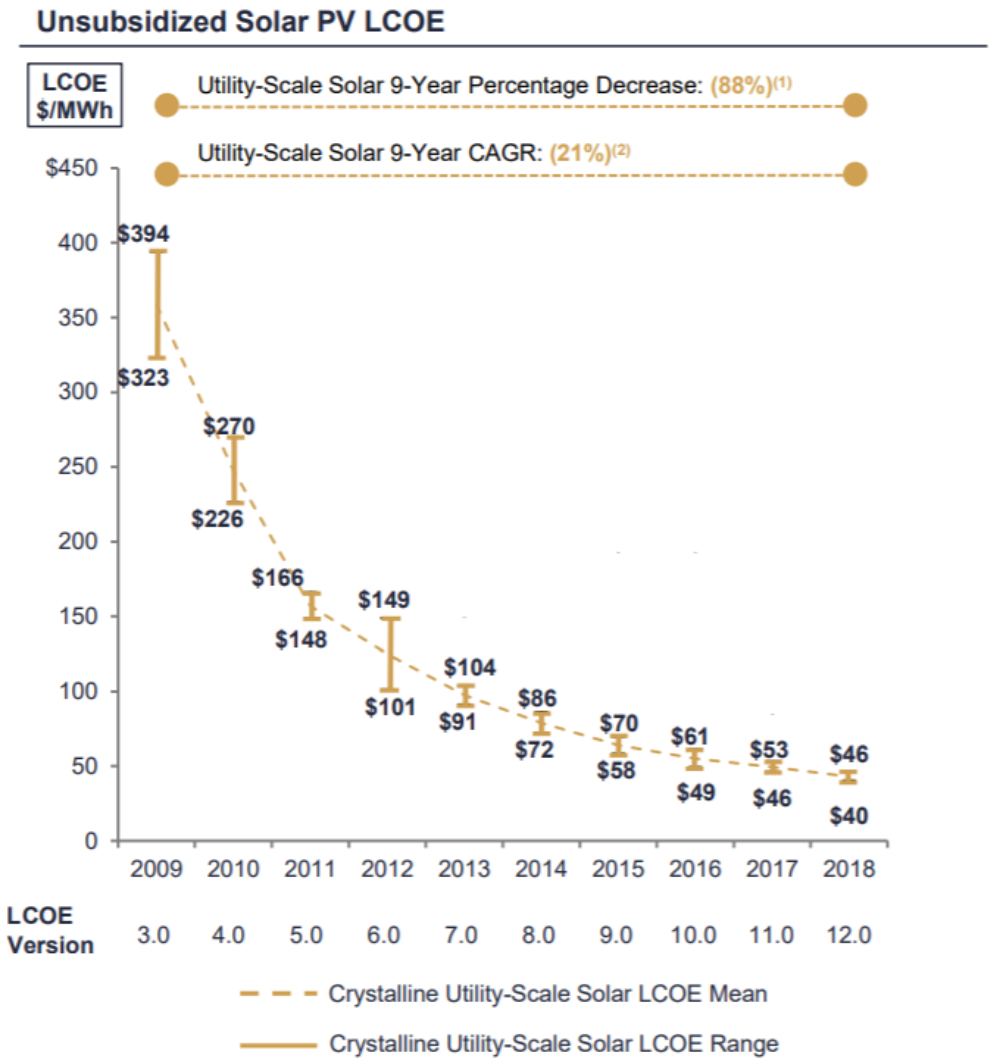
Toodetava elektri omahinna dünaamika 2009 – 18 (Lazard)



Lazard 2018

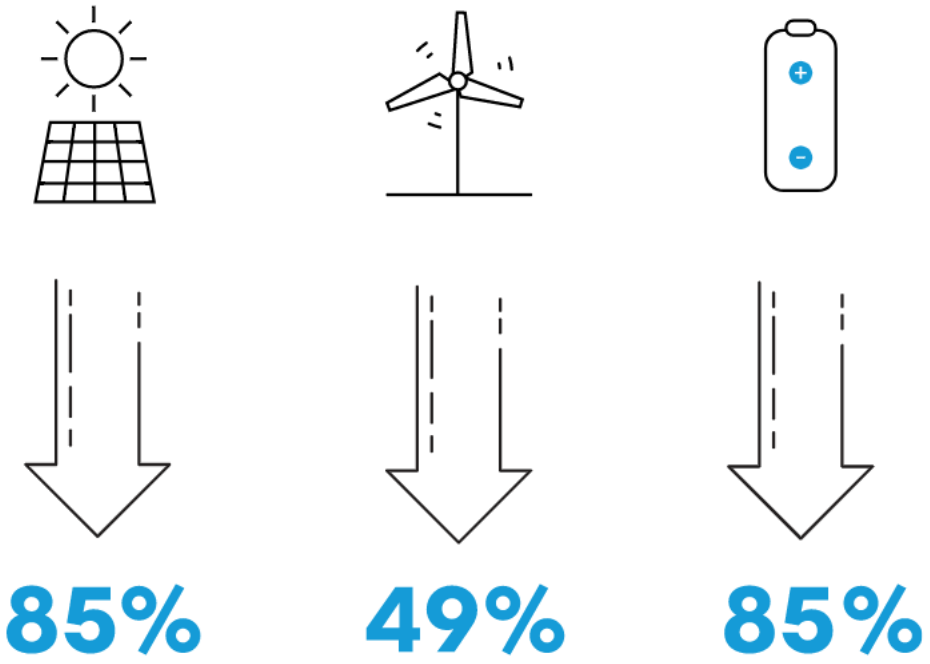
Päikeseelektri omahinna dünaamika 2009 – 18



Lazard 2018

Technology cost-declines since 2010

(Source: BloombergNEF)



BloombergNEF 2018

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Cost of PV modules in Europe 2018-19 (pvXchange)

Modulklasse	€/Wp	Trend seit August 2019	Trend seit Januar 2019	Beschreibung
Kristalline Module				
Bifacial	0,38	0,0 % →	- 11,6 % ↘	Module mit bifazialen Zellen und transparenter Rückseiten-folie oder Doppelglas-Module, gerahmt und ungerahmt.
High Efficiency	0,32	0,0 % →	- 8,6 % ↘	Kristalline Module ab 295 Wp, mit PERC-, HJT-, N-Typ oder Rückseitenkontakt-Zellen oder Kombinationen daraus.
All Black	0,35	+ 2,9 % ↗	- 2,8 % ↘	Modultypen mit schwarzer Rückseitenfolie, schwarzem Rahmen und einer Leistung zwischen 200 Wp und 330 Wp
Mainstream	0,25	- 3,8 % ↘	- 7,4 % ↘	Standardmodule, üblicherweise mit 60 polykristallinen Zellen, Alurahmen, weißer Rückseitenfolie und 270 Wp bis 290 Wp.
Low Cost	0,19	0,0 % →	+ 5,6 % ↗	Minderleistungsmodule, B-Ware, Insolvenzware, Gebraucht-module, Produkte mit eingeschränkter oder ohne Garantie

Quelle: www.pvxchange.com

HINWEISE FÜR DAS PV PREISBAROMETER

1. Es werden nur Netto-Preise für Photovoltaik-Module gezeigt.
2. Die Preise sind keine Endkundenpreise. Für eine durchschnittliche schlüsselfertige PV-Anlage muss der Wert in Deutschland mit dem Faktor 3-5 multipliziert werden.
3. Die Preise stellen die durchschnittlichen Angebotspreise auf dem europäischen Spotmarkt für verzollte Ware dar.

pvXchange 2018-19
https://www.pvxchange.com/de/aktuelles/preisindex

Spring 2018 – US imposes protective tariffs on modules import from China
September 2018 – expiration of protective mechanisms on Chinese modules import to EU

Solar PV in Estonia

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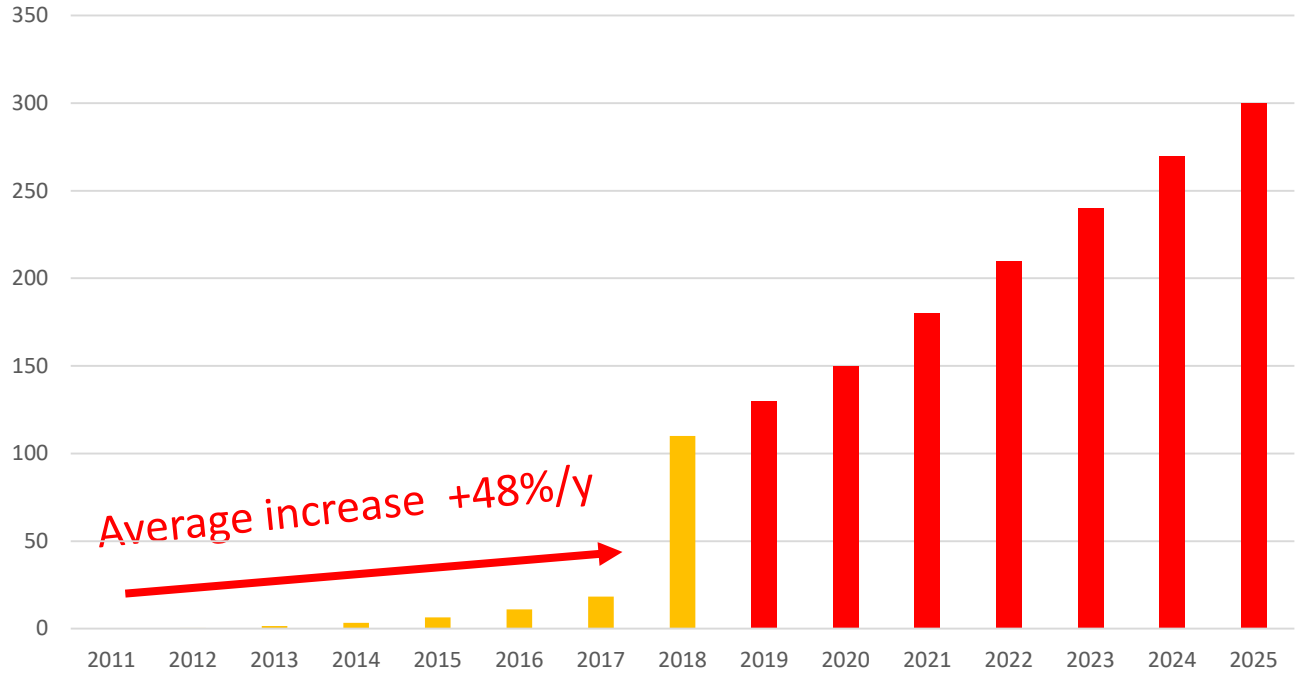
PV development in Estonia 2012 - 2019

- Capacity by end 2017 ca. 19MW
- New installations in 2018 ca. 90MW
- Qty of generators ca. 1600
- Largest generation units 1MW (Kärdla, Pärnu, COOP)
- In planning 40…50MW single generation unit at Raadi (Tartu)



2011-17 average increase in capacity **48%**

2018 increase in capacity 600%

Global average increase 33%
(2012 100GW – 2018F 500GW)
Last 2-3 years average annual increase ca. 100GW

Generated power:
2018 ca. **18 GWh = 0,2%** of total consumption (8,38 TWh)
2019 ca. **100GWh = 1,3%** of total consumption
Päikeseelektrijaamde koguvõimsus
2019 110 MW = 3,7% of total generation capacity (2 947MW)

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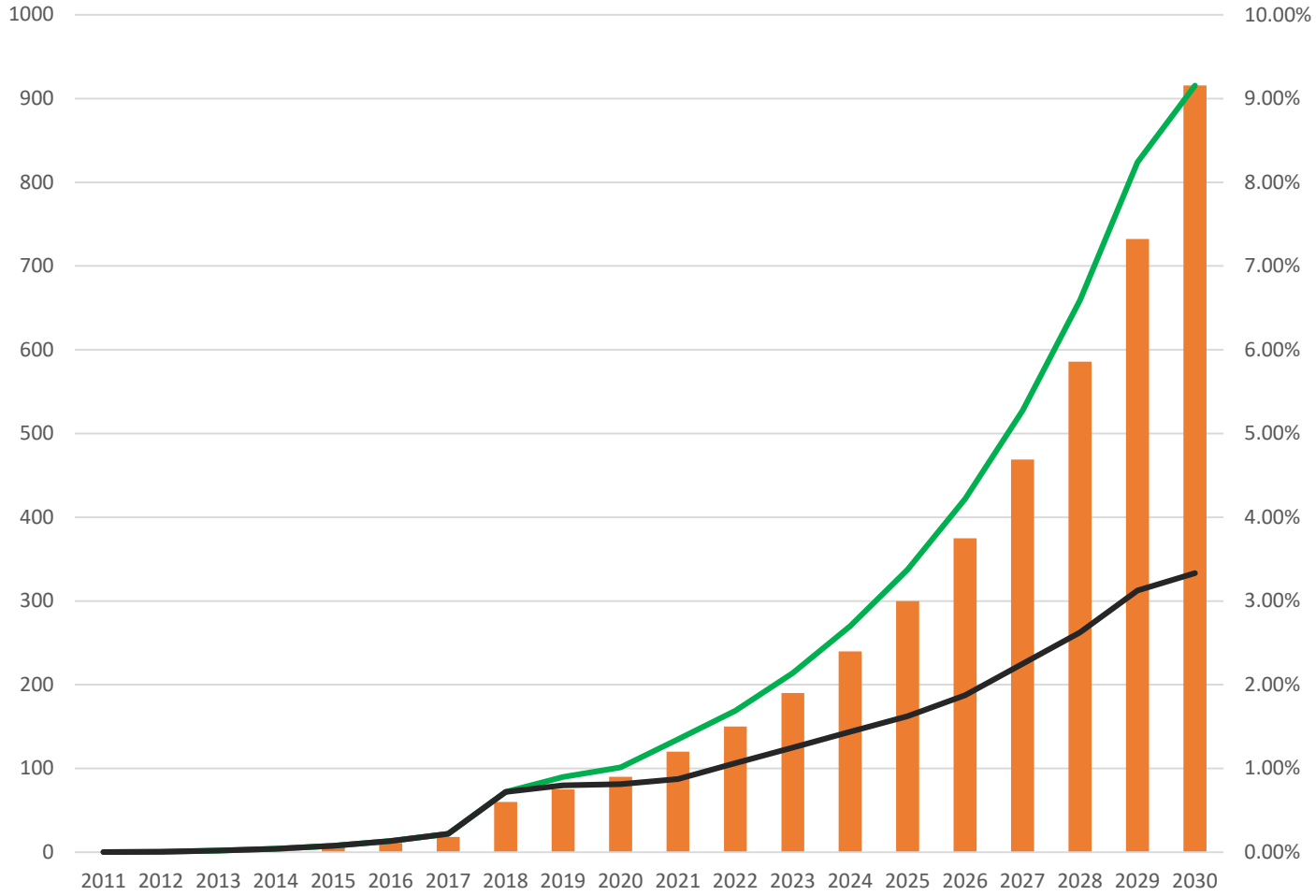
PV capacity and share in energy consumption 2020… 30… 50

Installed capacity and share of consumption:

2020 ca. 110MW from consumption **1,5%**

2030 ca. 900MW from consumption **9%**?

2050 ? MW share of consumption … %



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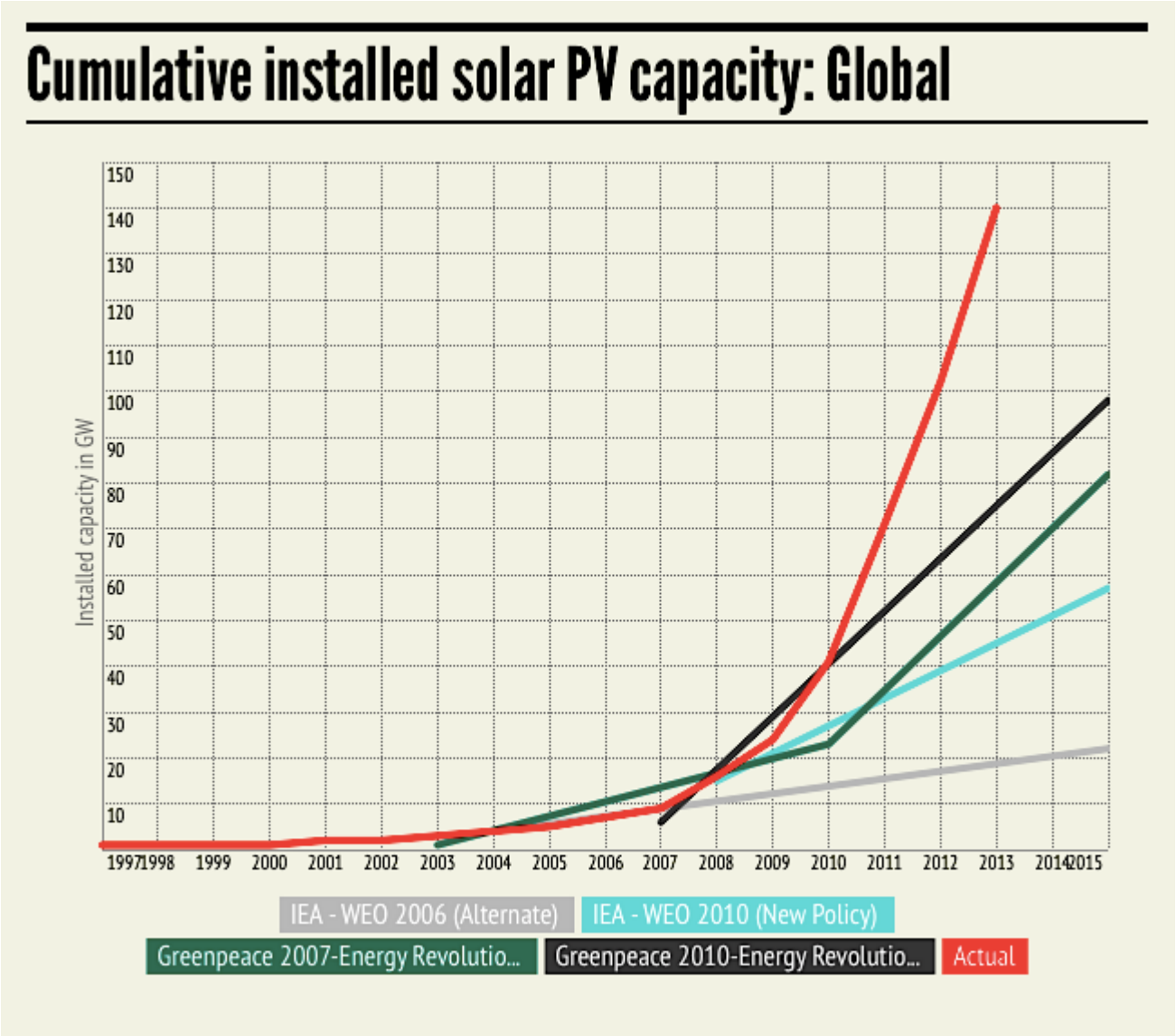
Accuracy of forecast?

PV growth forecasts are complicated and influenced by large variety of unpredictable factors. Forecasts of respectable think-tanks (IEA) are steadily adjusted, yet, so far have always been far too conservative.

So far most accurate forecasts by radical environmental organization Greenpeace, yet, also these have turned out to be too conservative.



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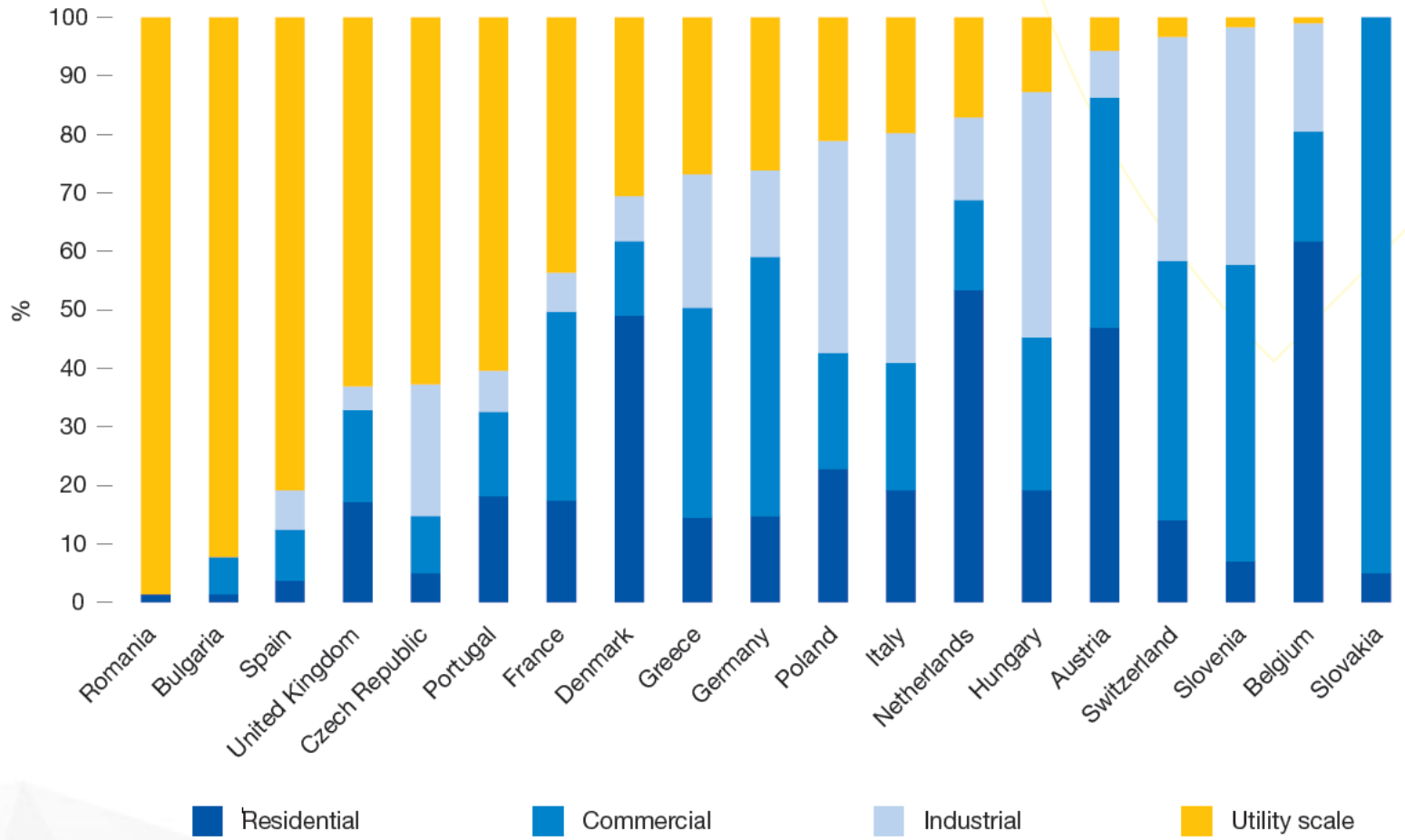
PV business segments in Europe

FIGURE 34 EUROPEAN SOLAR PV TOTAL CAPACITY SEGMENTS UNTIL 2018 FOR SELECTED COUNTRIES



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SolarPowerEurope Global Market Outlook 2019-23

Business cases:

Behind the meter generation

SÜPRUSE ÄRIMAJA

EPEA

omniva

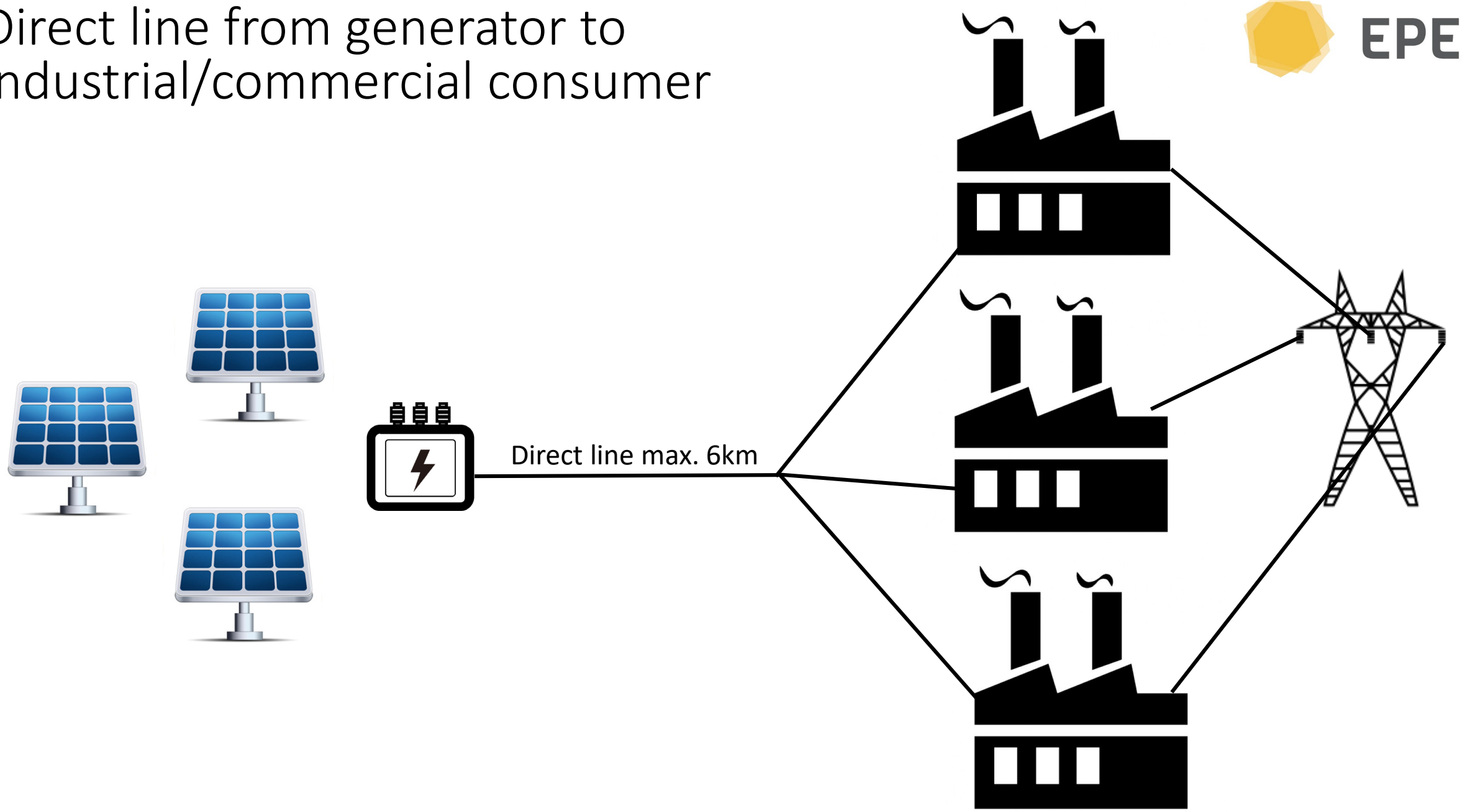
coop

PPA

EPEA

*PPA – Power Purchase Agreement

Direct line from generator to industrial/commercial consumer



Directive on energy performance of buildings (**2010/31/EU**):

01.01.2019 publicly owned buildings

01.01.2021 all new buildings

NZEB or ZEB

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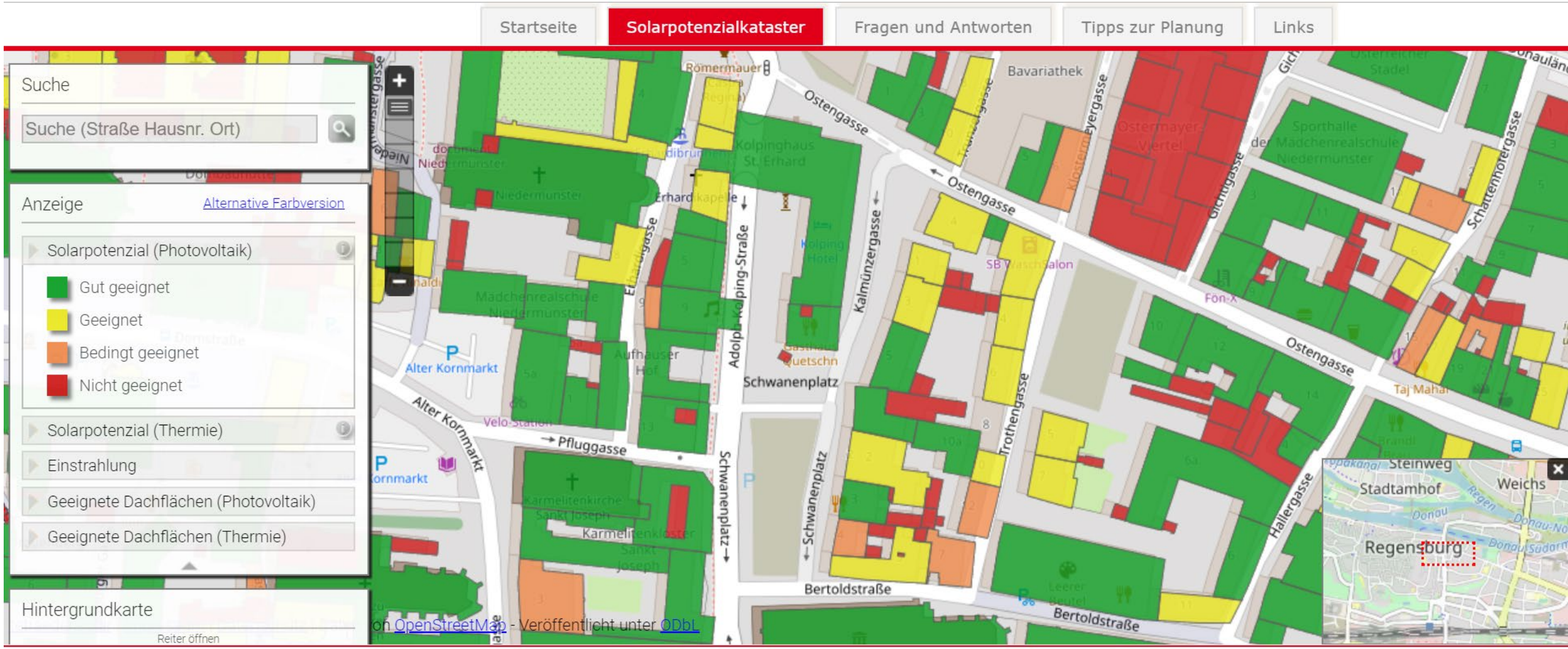
Some buildings are ideally suitable for PV, some are so-so, some not at all…



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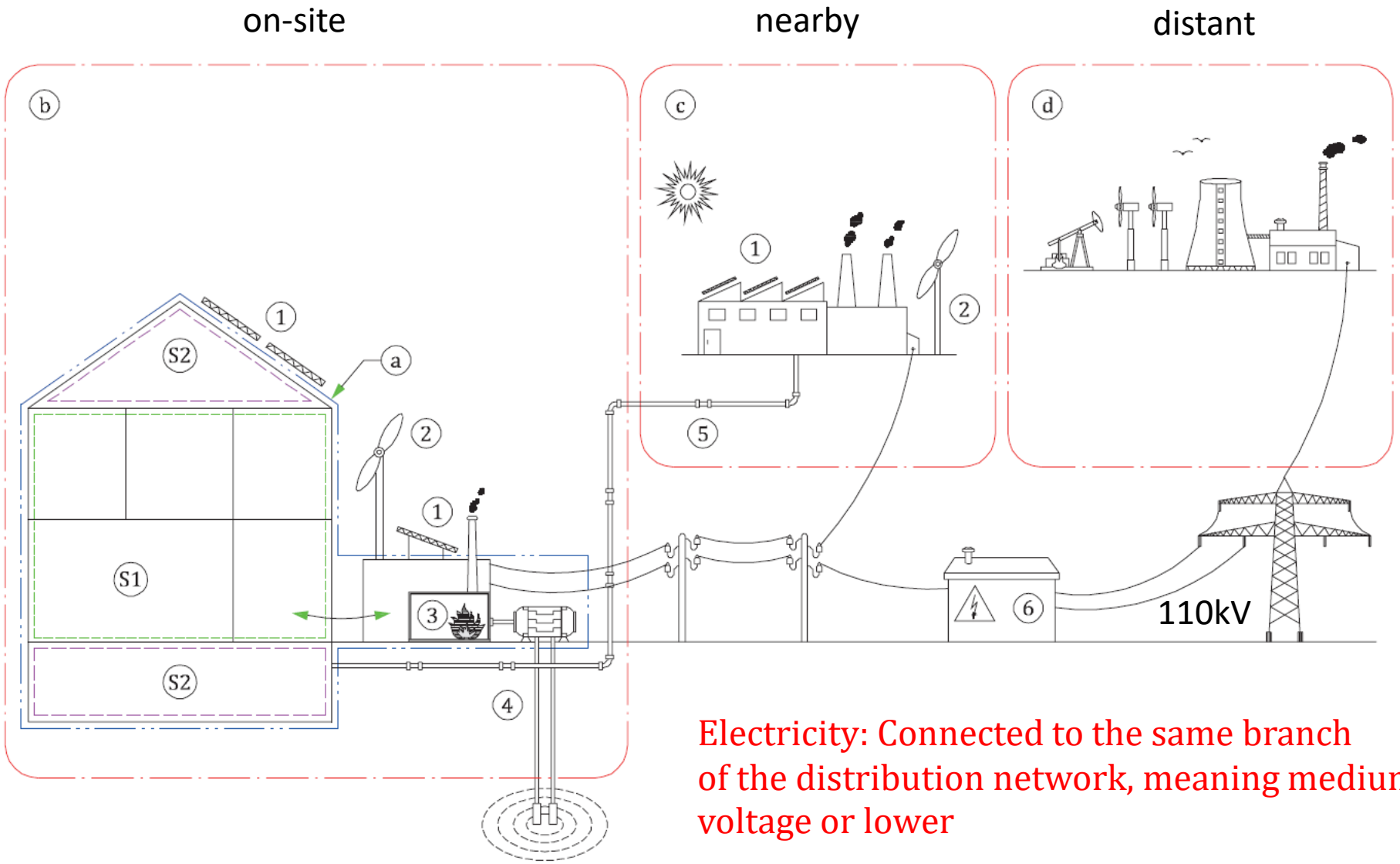
https://www.solare-stadt.de

How far is nearby?

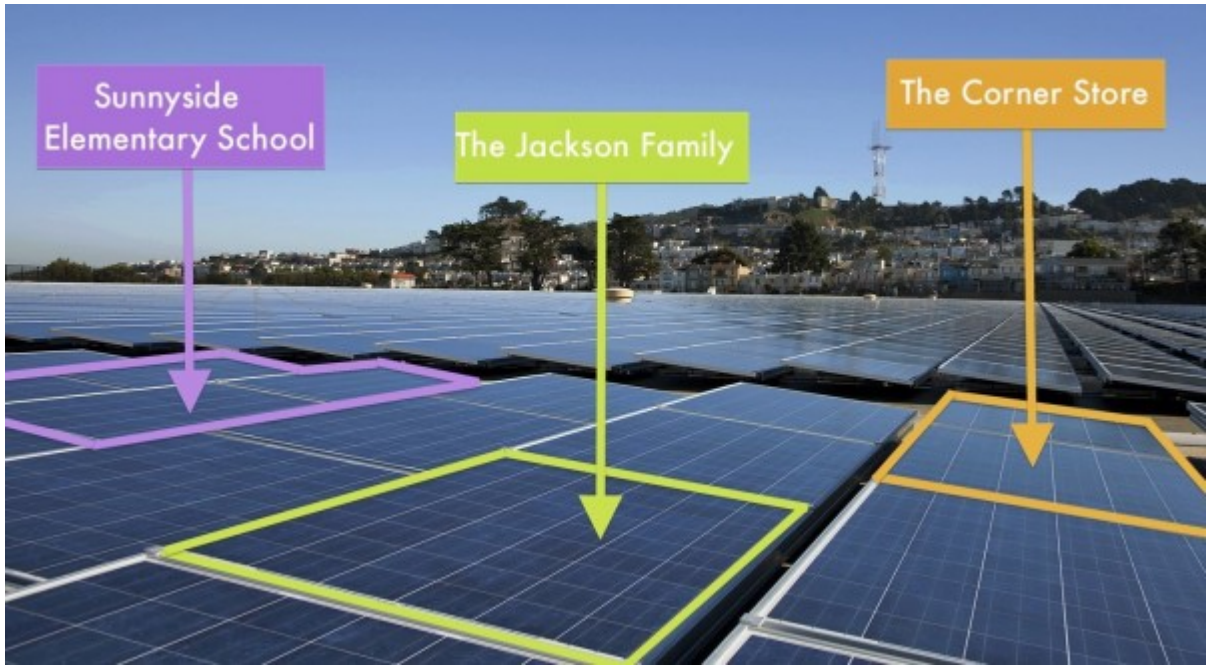
Standard:
EVS-EN ISO 52000-1:2017

Energy performance of buildings - Overarching EPB assessment –
Part 1: General framework and procedures

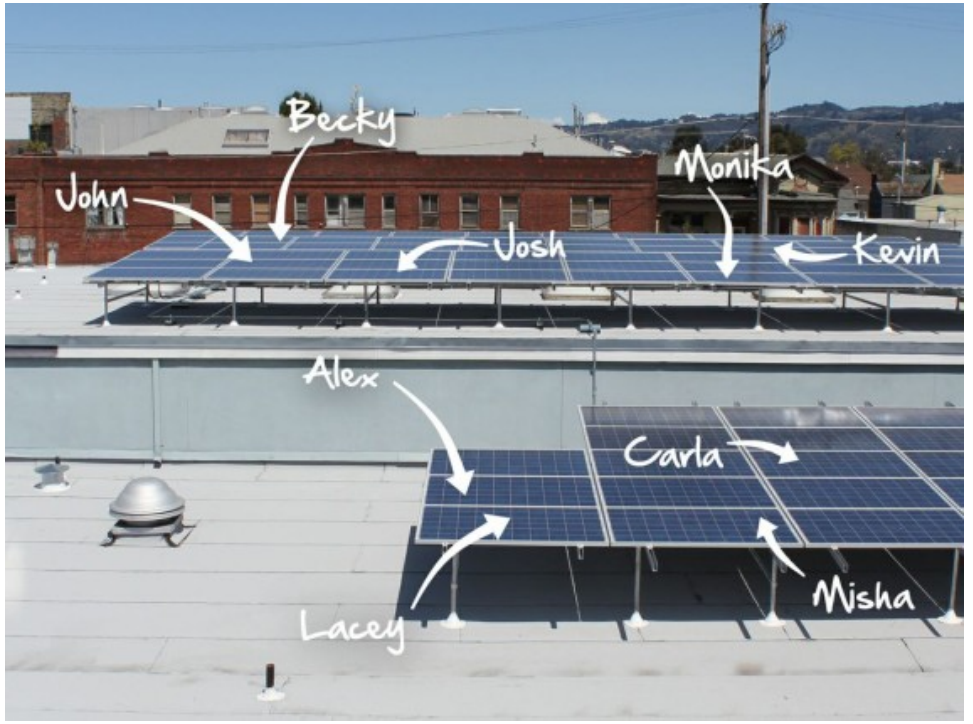


Electricity: Connected to the same branch of the distribution network, meaning medium voltage or lower

New business models



- Community and co-op projects
- Crowdfunding
- Social projects



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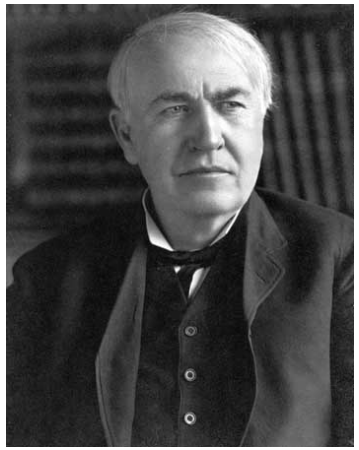

“I’d put my money on the sun and solar energy. What a source of power! I hope we don’t have to wait until oil and coal run out before we tackle that.”
Thomas A. Edison, 1931

TÄNAN!

andres.meesak@eesti.ee
Ph: +3725014711