



Interreg



2 Seas Mers Zeeën
SOLARISE

European Regional Development Fund

Output 1

Richtlijnen voor zonne-energie
toepassingen in 2Zeeën regio:
wetgeving, markt, technologieën
en best practices



Low-carbon
technologies

TOTAL PROJECT
BUDGET:

4.35 M €

INCLUDING AN
ERDF BUDGET OF:

2.61 M €

Prof.dr.ir. Emilia Motoasca – KU Leuven; 24.01.2020



Solarise = Interreg 2 Zeeën project dat:

- de adoptie van zonne-energie in historische en openbare gebouwen en voor huishoudens wil stimuleren, met de nadruk op gezinnen met een laag inkomen, en dat ook toekomstige technologieën laat zien door middel van proeftuinen.
- de impact van de zonne-energie op het elektriciteitsnet wil verminderen, bijvoorbeeld door het installeren van opslagcapaciteit.

Doelstellingen

Stimuleren, verbreden en versnellen van zonne-energie adoptie in de 2Zeeën
door middel van:

- Het identificeren en overwinnen van de barrières;
- Gebruik te maken van slimme netwerken, opslag van elektriciteit/warmte, internet of things en energiemanagementsystemen;
- Kosteneffectieve en betaalbare oplossingen voor te stellen;
- Het implementeren van innovatieve living-labs en een reeks demonstraties in openbare gebouwen/infrastructuur en voor huishoudens met lage inkomsten;
- Het leveren van trainingshulpmiddelen en zonne-energieplannen.

Consortium Partners



www.interregsolarise.eu



Residentiële gebouwen
(sociale huisvesting)



Historische gebouwen
(monumenten of niet)



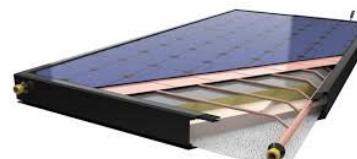
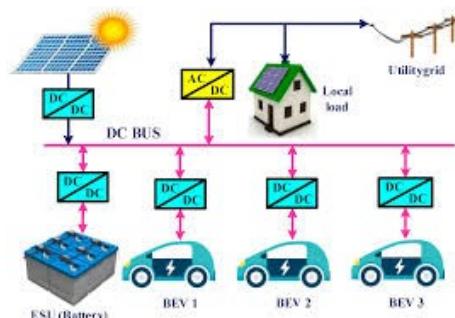
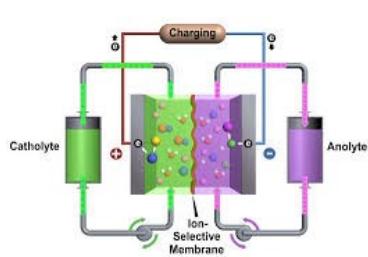
Openbare gebouwen
(scholen, stadhuisen)



Solar farms in
peri-urbane omgeving



Smart (micro) grids,
V2G slim energiebeheer,
energieopslagsystemen



Onopvallende integratie in gebouwen
(BIPV, transparante PV...)

Hybride systemen (elektriciteit & warmte)
PV/T, Bi-faciale PV, CSP, BISPV, ...



PROJECT

WP1: Contextueel kader

WP2: Haalbaarheidsstudies

WP4: SOLARISE demonstratieprojecten

WP3: Versnelling uitrol zonne-energie

WP 5: Project Management

WP 6: Communicatie

Start:03/18 ----- Eind:09/21

1. Proeftuinen (living-labs)
2. Residentiële, historische en openbare gebouwen
3. Zonnefarms

OUTPUT 1



Gebaseerd op WP1 (Contextueel kader) met activiteiten en leverbarheden:

- **Richtlijnen** voor benchmarking en pilots
- Technisch verslag over **smart grids**
- Verslag: **zonne-energie markt, juridisch kader en toekomstig potentieel**
- Verslag: **kosten en investeringsmodellen** voor het oogsten van zonne-energie
- Technisch rapport over **hybride PV/T systemen**
- Technisch verslag over **innovatieve zonnetechnologieën**
- **Database**: inventarisatie van bestaande pilots, benchmarks en goede praktijken

OUTPUT 1

Is bedoeld om:

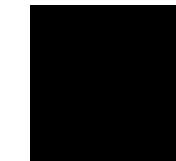
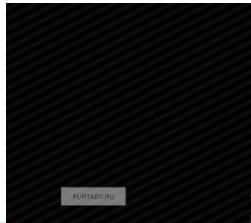
- de belanghebbenden (stakeholders) een **duidelijk beeld te geven van de context van zonne-energie** in de 2 Zeeën regio vanuit verschillende complementaire domeinen
- **bewustzijn** op te wekken mbt:
 - de laatste beschikbare/veelbelovende **innovaties**
 - de mogelijke manieren voor een **flexible en kosteneffectieve implementatie** van zonne-energie



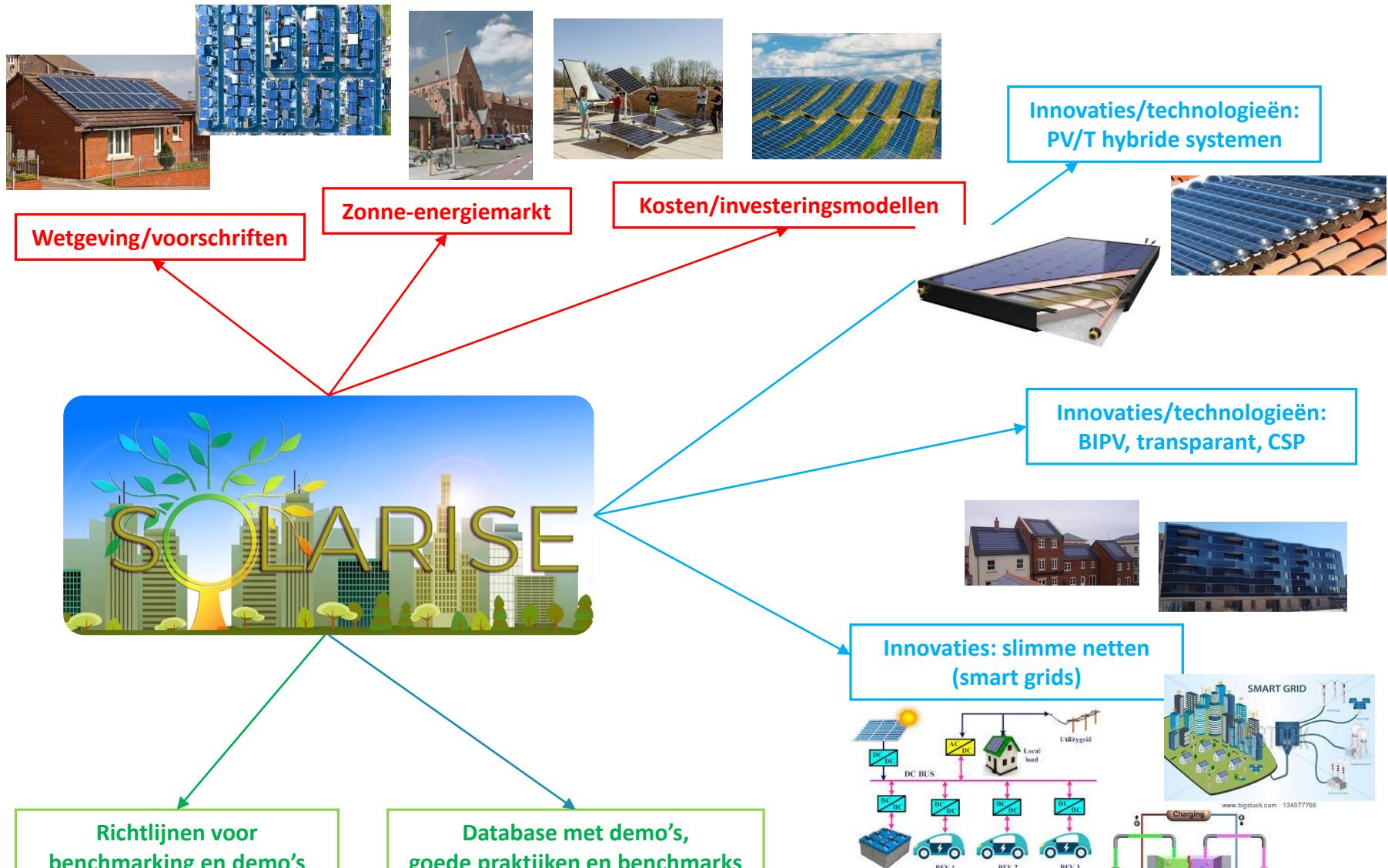


OUTPUT 1

Stakeholders involvement

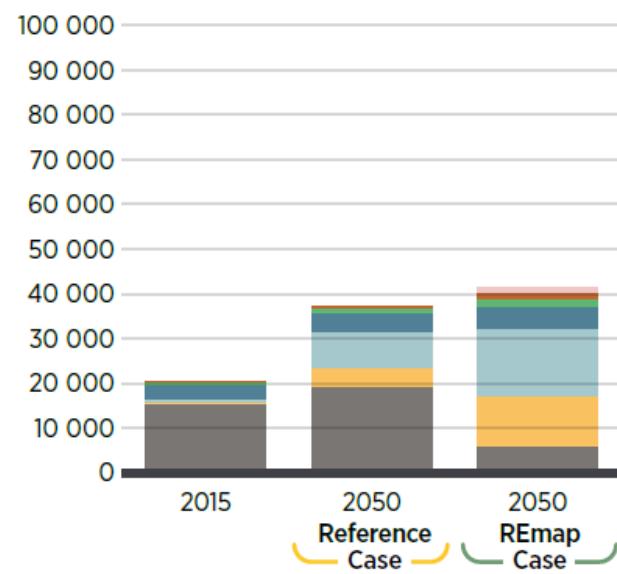


Stakeholders	Academics (R&D instit)	Municipalities	Politicians	Installers (commercial SME)	Citizens cooperatives
Affiliation	Univ/Instit	Local authority	Policy makers	SME	None
Objective (stakeholder needs)	Knowledge	Solve problems	Societal relevant	Solve problems Commercial	Knowledge
How (what to offer)	Novelty	Usefulness	Impact	Econ. yield	Usefulness Econ. yield
Stakeholder expertise	Multi-disciplinary	Non-technical Mono-disciplinary	Non-technical Mono-disciplinary	Technical Mono-disciplinary	Non-technical



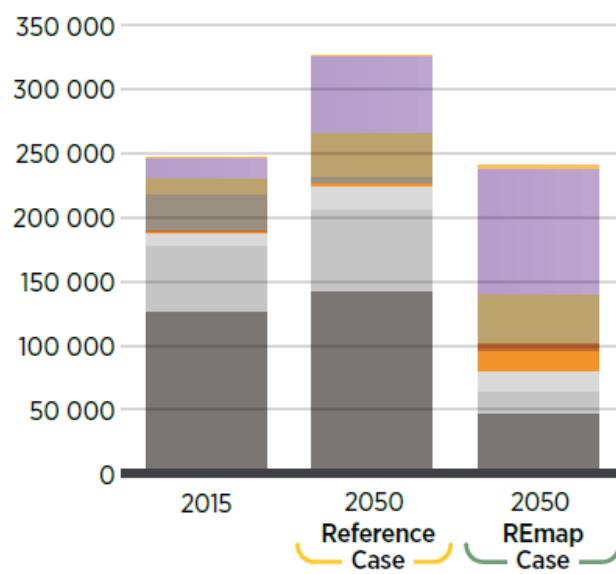
Mondiale energiecontext: RE roadmap 2050?

Electricity consumption (TWh)



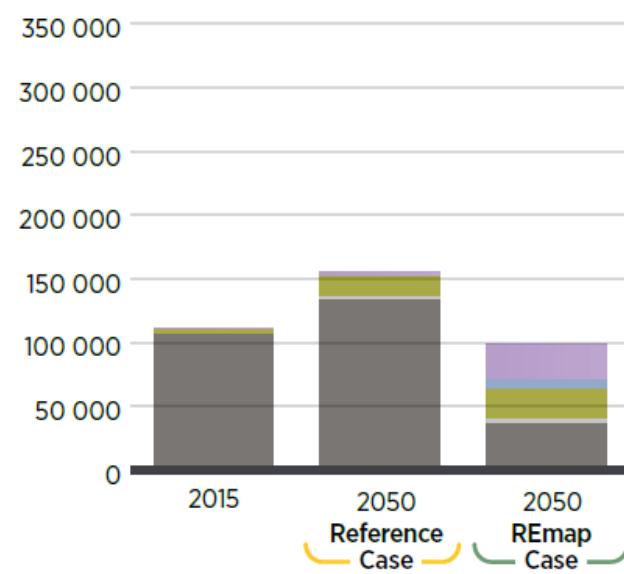
- Others (incl. marine and hybrid)
- Geothermal
- Bioenergy
- Hydro power
- Wind
- Solar PV (incl. CSP)
- Non-Renewables

Industry and buildings final energy consumption (PJ/yr)



- District heat: Renewables
- Electricity: Renewables
- Modern biomass
- Traditional biomass
- Geothermal heat
- Solar thermal

Transport final energy consumption (PJ/yr)



- Hydrogen
- Liquid biofuels/biogas
- Non-Renewables
- District heat: Non-Renewables
- Electricity: Non-Renewables

Bron: IRENA 2018 'Global energy transformation: A roadmap to 2050'

2Zeeën energiecontext - ingebed in EU context



Investment:

extra EUR 177 billion per year of investment from 2021 to meet 2030 climate & energy targets
Crucial role for EFSI



Economic growth*:

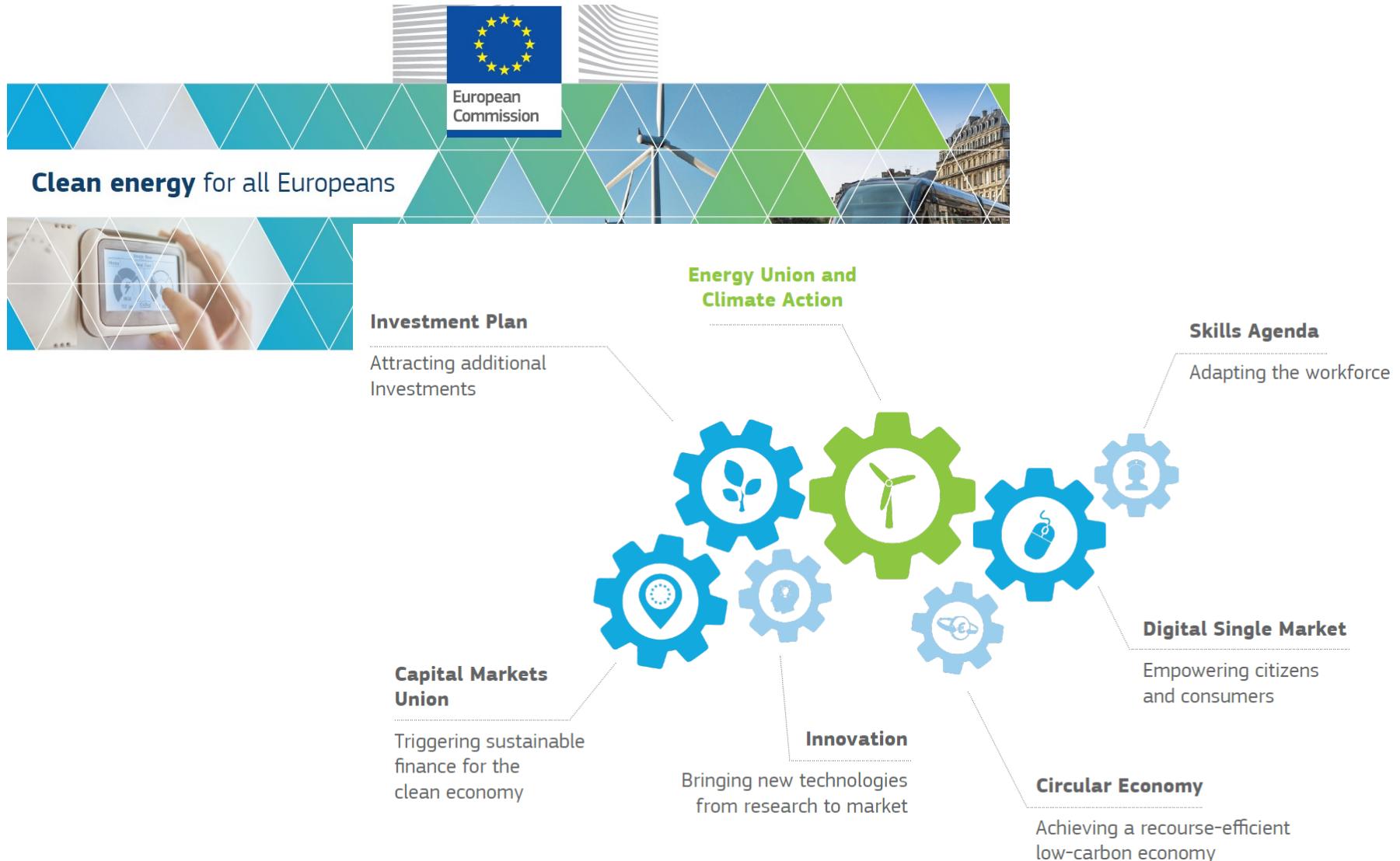
1% increase in GDP
EUR 190 billion into the economy
900,000 new jobs
*Upper end of estimates



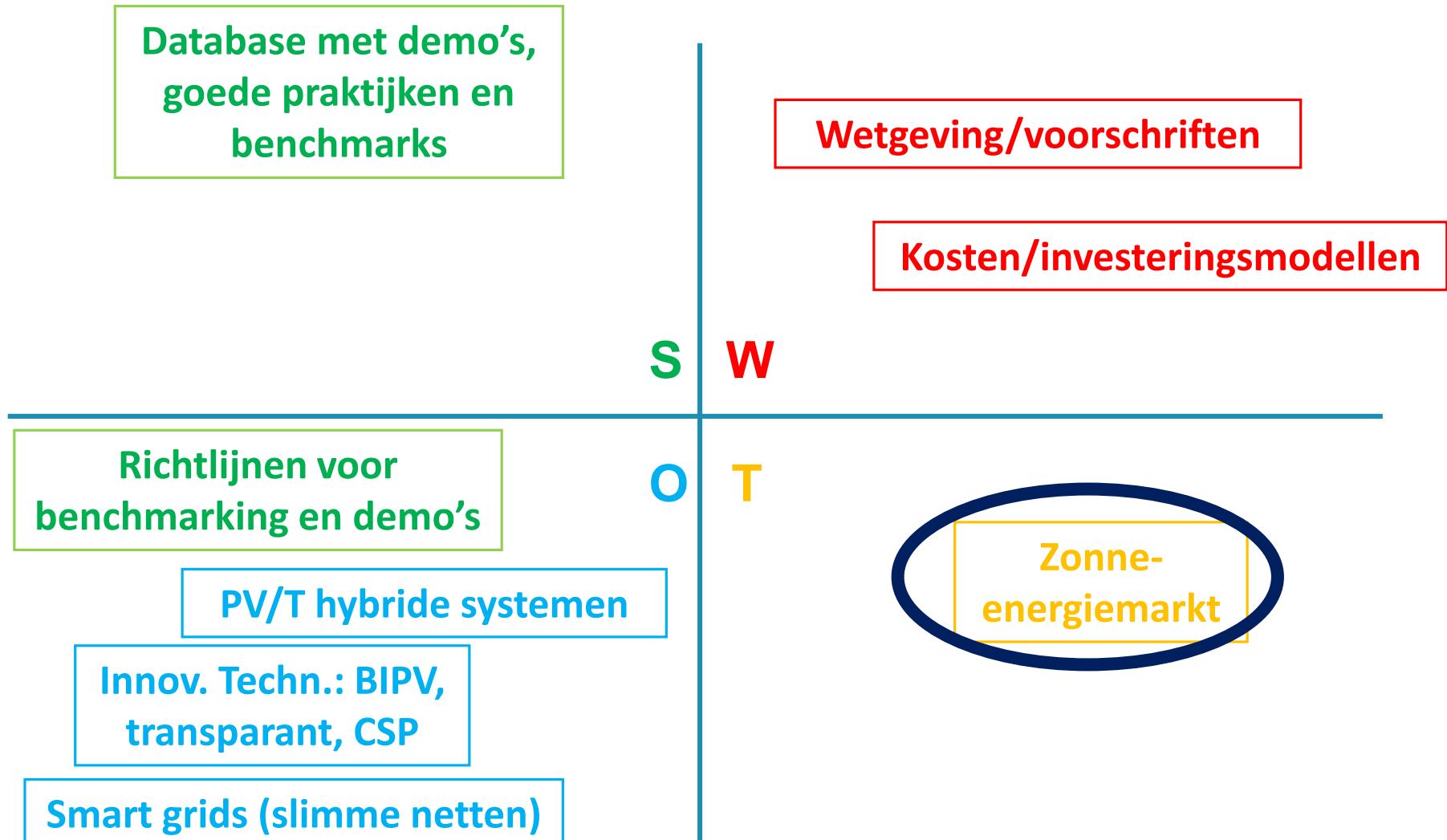
Decarbonisation:

Carbon intensity of the economy 43% lower in 2030 than in 2015
72% share of non-fossil fuels in electricity generation in 2030

2Zeeën energiecontext - ingebed in EU context

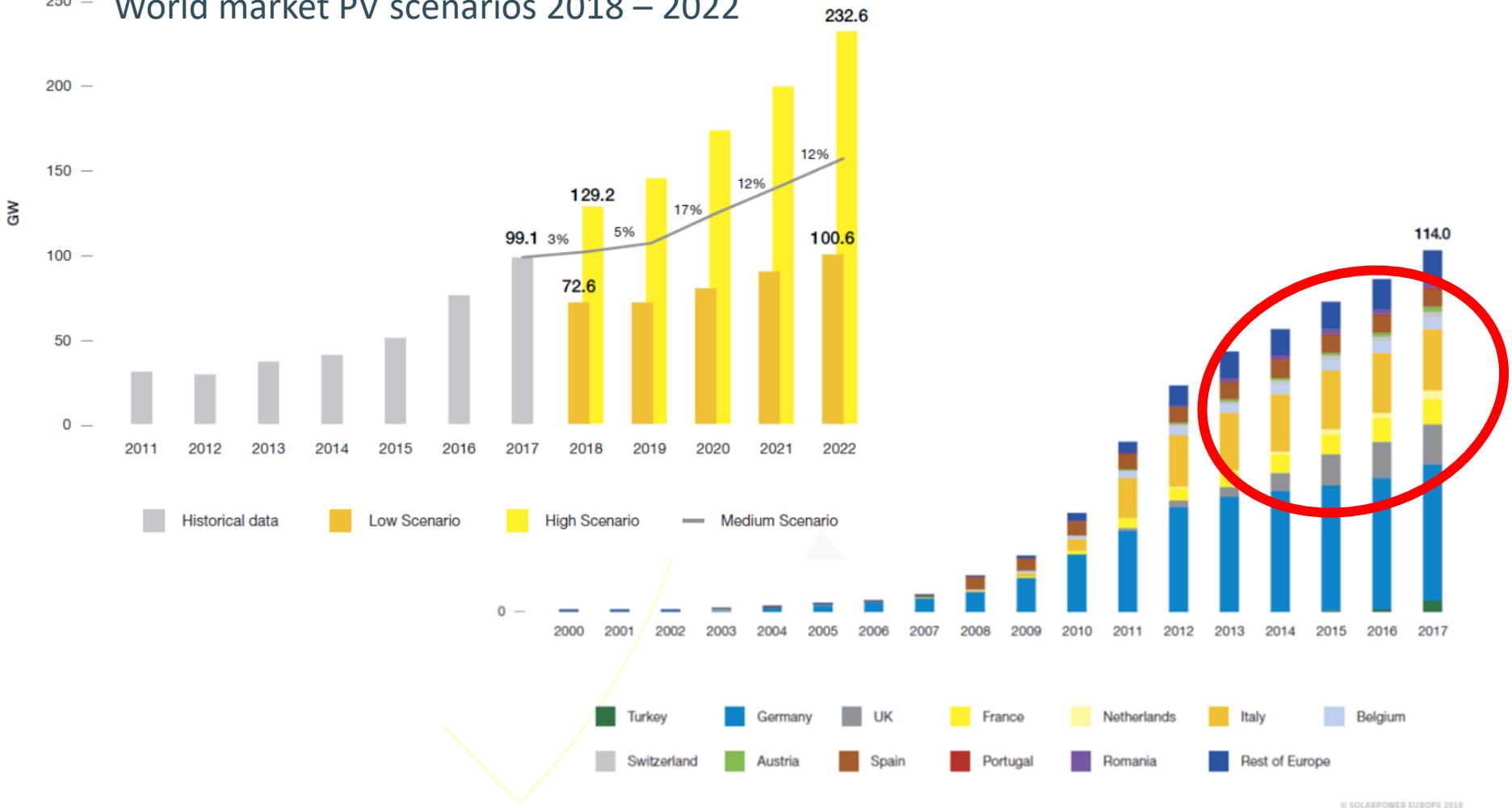


Zonne energie in 2Zeeën gebied



2Zeeën – Zonne energie markt

250 – World market PV scenarios 2018 – 2022



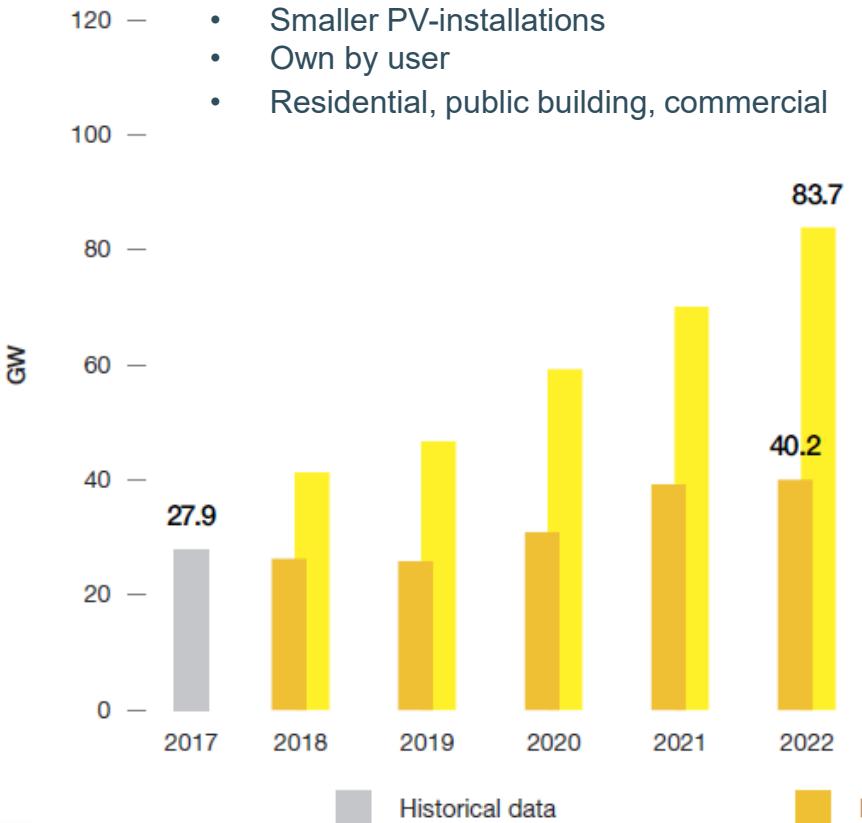
Source: Solar Power Europe

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2Zeeën – Zonne energie markt

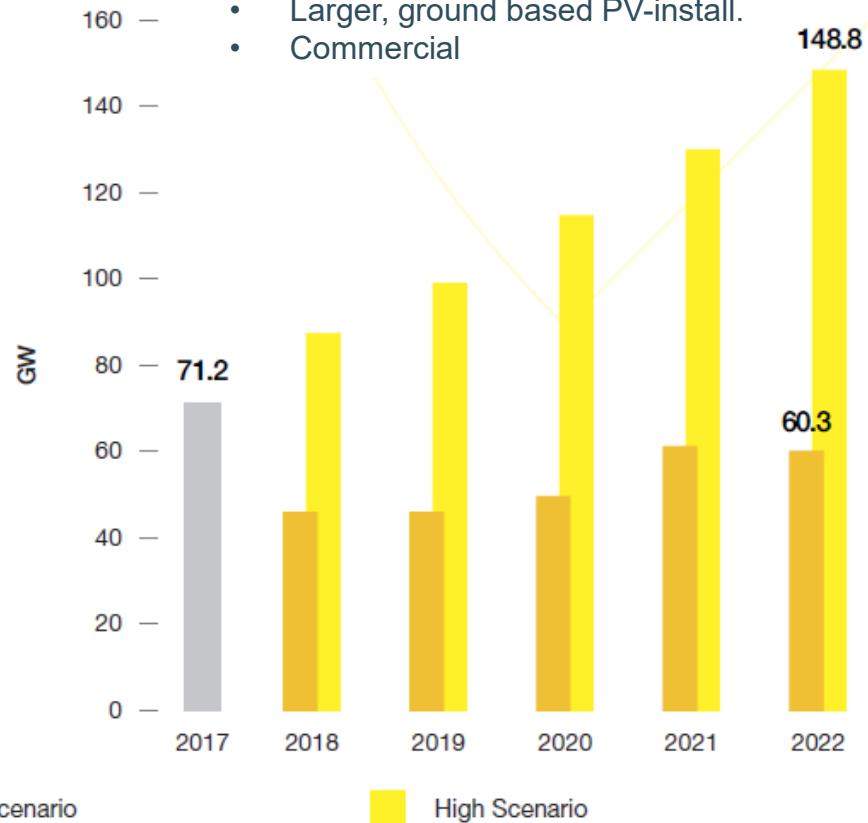
ROOFTOP PV

- Smaller PV-installations
- Own by user
- Residential, public building, commercial



UTILITY SCALE PV

- Larger, ground based PV-install.
- Commercial

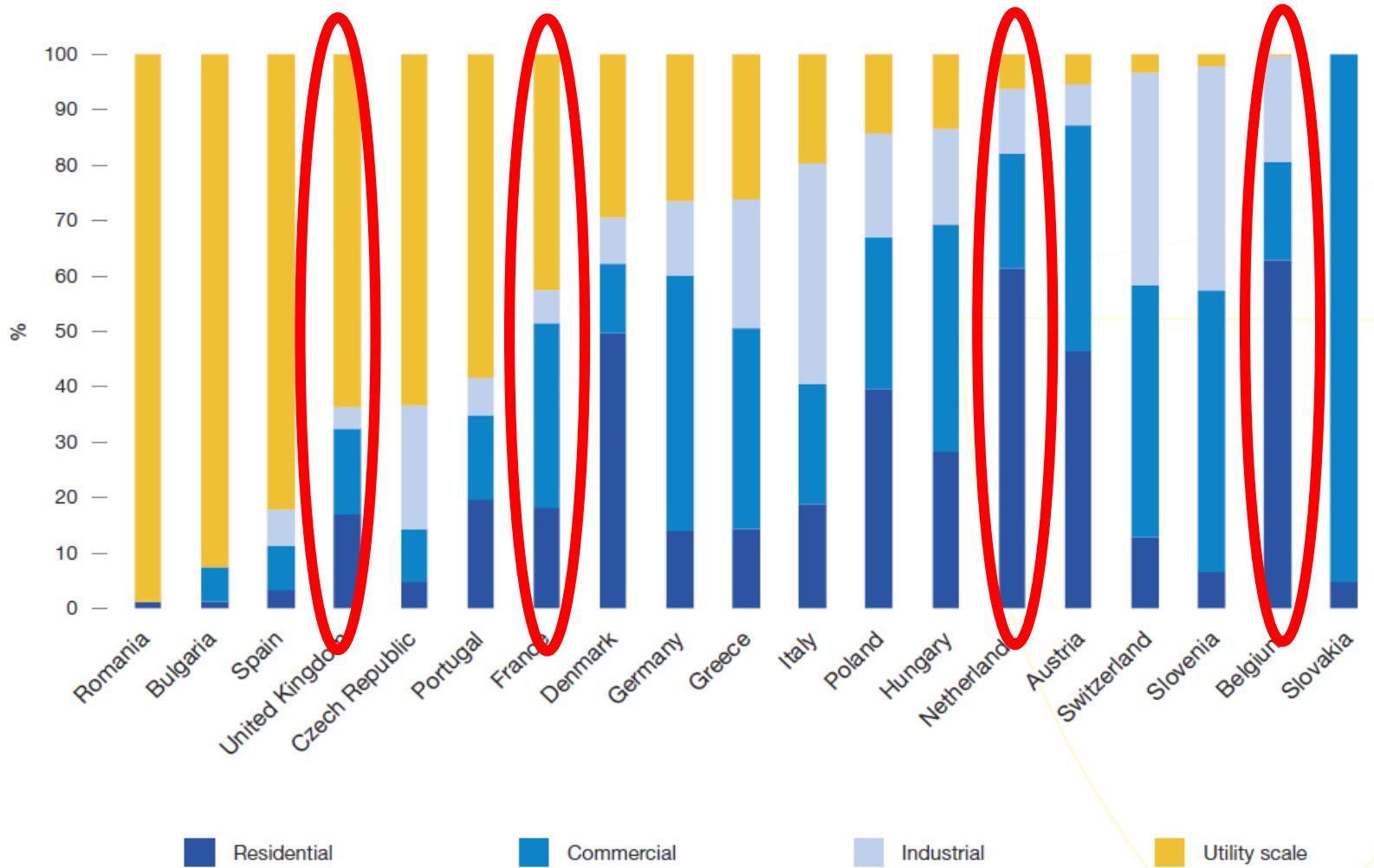


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Scenarios for PV installations 2018 -2022

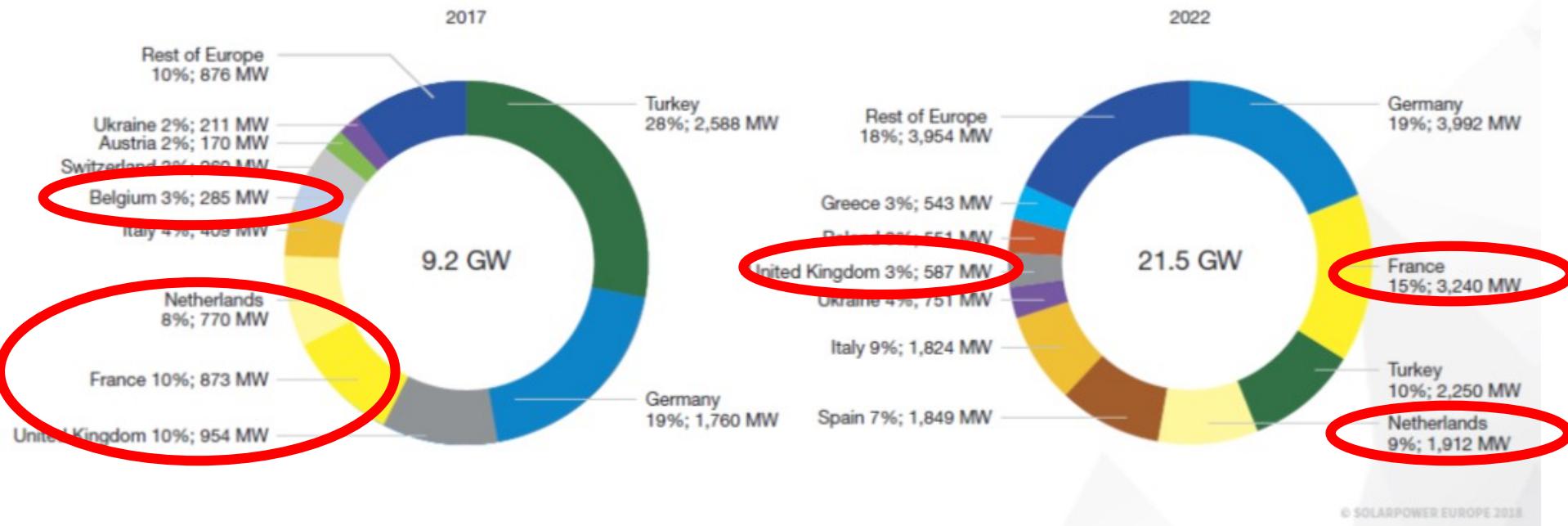
Source: Solar Power Europe

2Zeeën – Zonne energie markt



Source: Solar Power Europe¹⁰

2Zeeën – Zonne energie markt

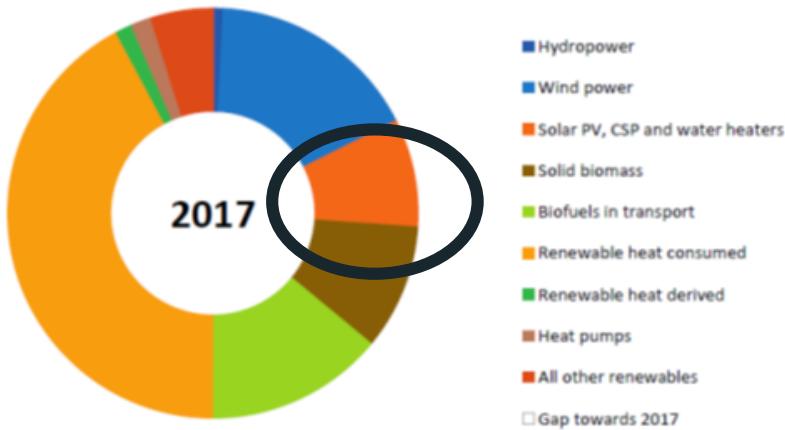


Source: Solar Power Europe

2Zeeën – Zonne energie markt

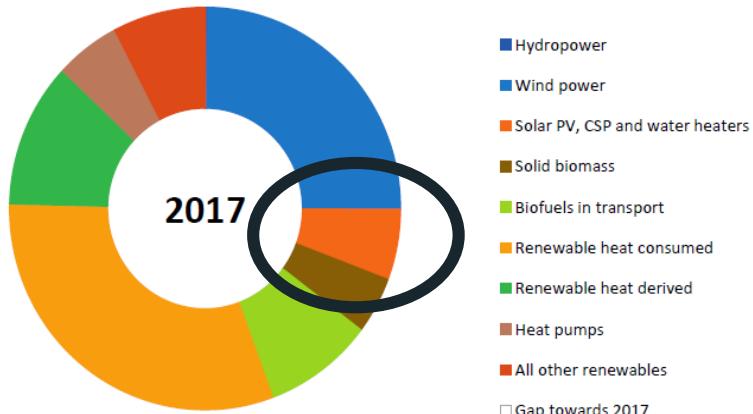
Source: EEA Eurostat 2019

Belgium



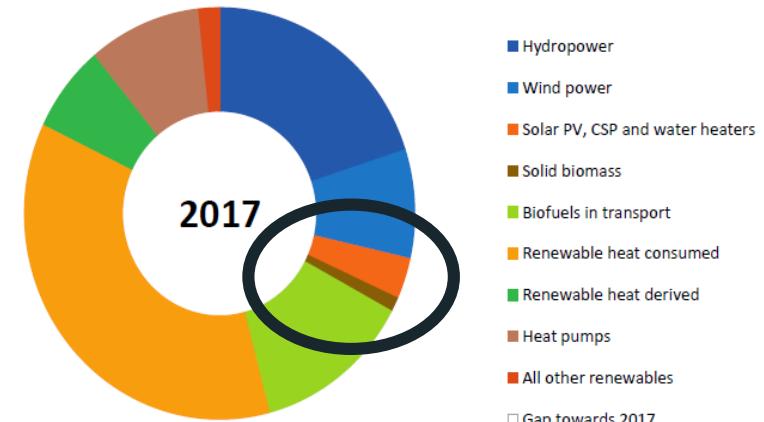
Source: Eurostat, 2019.

Netherlands



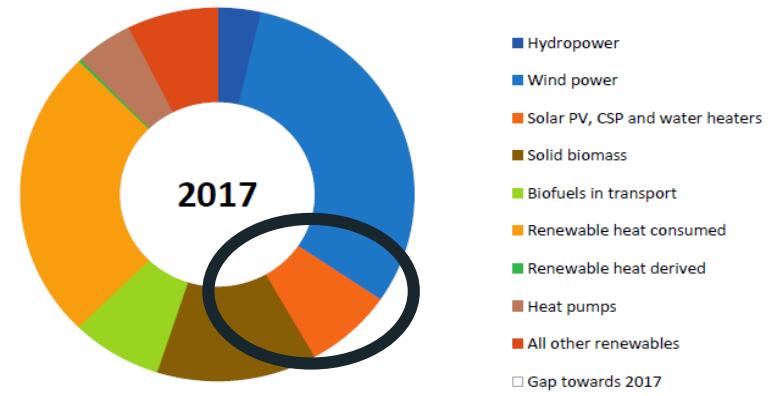
Source: Eurostat, 2019.

France



Source: Eurostat, 2019.

United Kingdom



Source: Eurostat, 2019.

2Zeeën – Lokale fabrikanten

Tabl. n° 5

Main photovoltaic module manufacturers in 2018

Company	Country
Jinko Solar	China
JA Solar	China
Trina Solar	China
LONGI Solar	China
Canadian Solar	China
Hanwha Q-CELLS	Korea
Risen Energy	China
GCL-SI	China
Talesun	China
First Solar	USA

*Estimates from GlobalData. Sources: Annual reports, GlobalData.

Over the past two years, most of the Chinese photovoltaic players have delisted from the American stock market obligations, information about them has become much scarcer. This primarily applies to their annual financial reports.

Gemeenschappelijke uitdagingen:

- Geen grote lokale fabrikanten van PV-modules en zonnecollectoren
- Volledig afhankelijk van de invoer

Tabl. n° 6

Representative European solar thermal collector manufacturers

Company	Country
GREENoneTEC	Austria / China
Dimas	Greece
Bosch Thermotechnik	Germany
Solimpeks	Turkey
Thermosolar	Slovakia
Eraslanilar	Turkey
Hewalex	Poland
Vlessmann	Germany
Delpaso Solar	Spain
Ariston	Italy
Vaillant Group	Germany
Arcon-Sunmark	Denmark
Nobel	Bulgaria
Cosmosolar	Greece
BDR Thermea	Spain

Source: EuroSolar'ER 2019.

2Zeeën – Lokale ontwikkelaars

Tabl. n° 6

Main European solar photovoltaic *developers in 2018*

Company	Country	Installed photovoltaic capacity (MW)
Enerparc	Germany	2 000
Lightsource BP	United-Kingdom	2 000
EDF Renouvelables	France	2 402
Juwi AG	Germany	2 500
Belectric	Germany	2 240
Voltalia	Portugal	1 800
Enel Green Power	Italy	1 553
Scatec Solar	Norway	> 1000
ENGIE Green	France	935 (France)

Source: EurObserv'ER

Gemeenschappelijke kenmerken:

- Geen tekort aan ontwikkelaars van PV-systemen
- Creatie van nieuwe banen in hetzelfde tempo voor de 4 landen

SWOT - 2 Zeeën Zonne-energiemarkt

- Lage(re) prijzen componenten
- Betrouwbare producten (garanties)

- (Bijna) Geen lokale productie (modules)
- Dure bewakings-/besturingsoplossingen

S

W

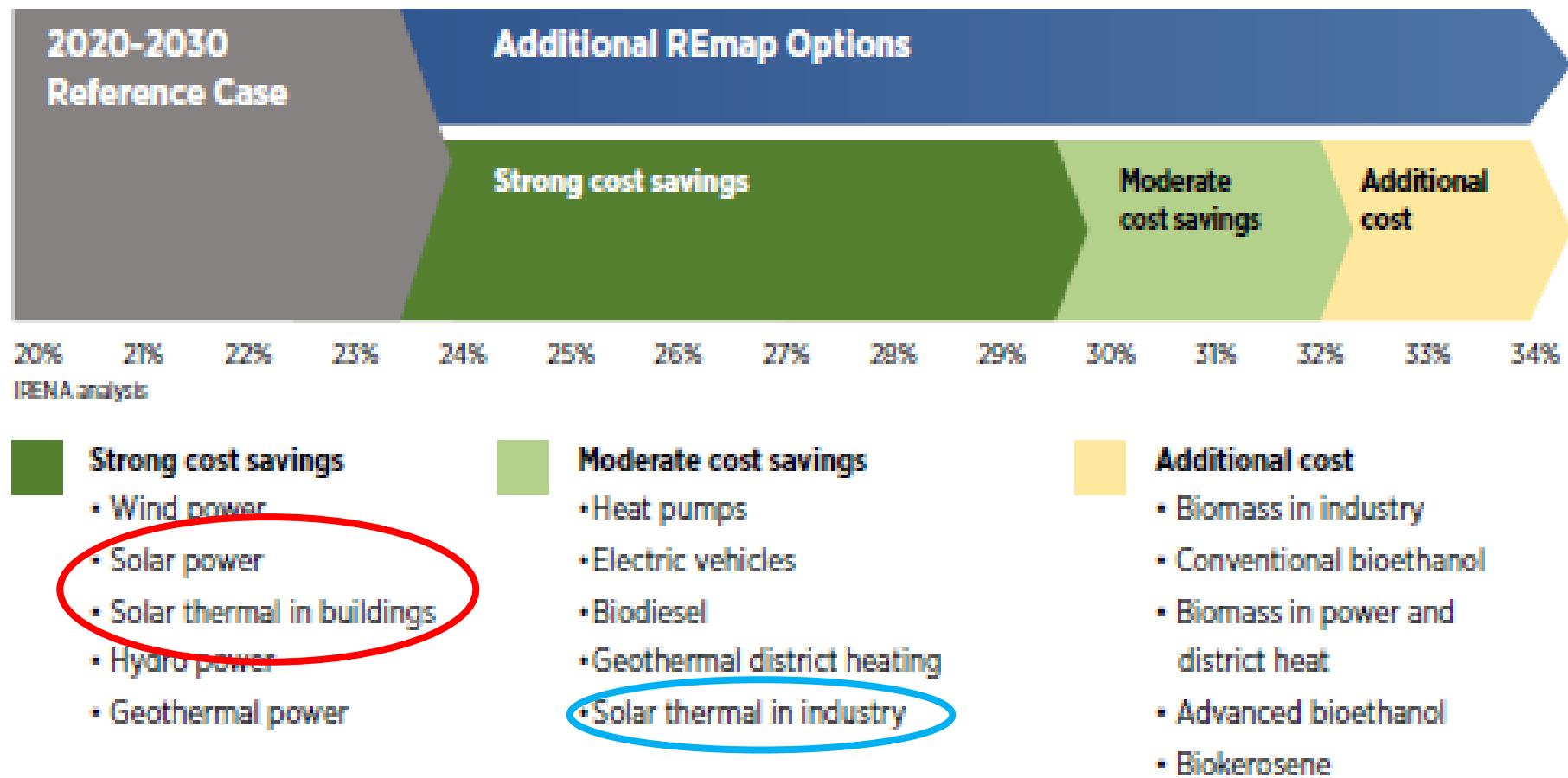
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T

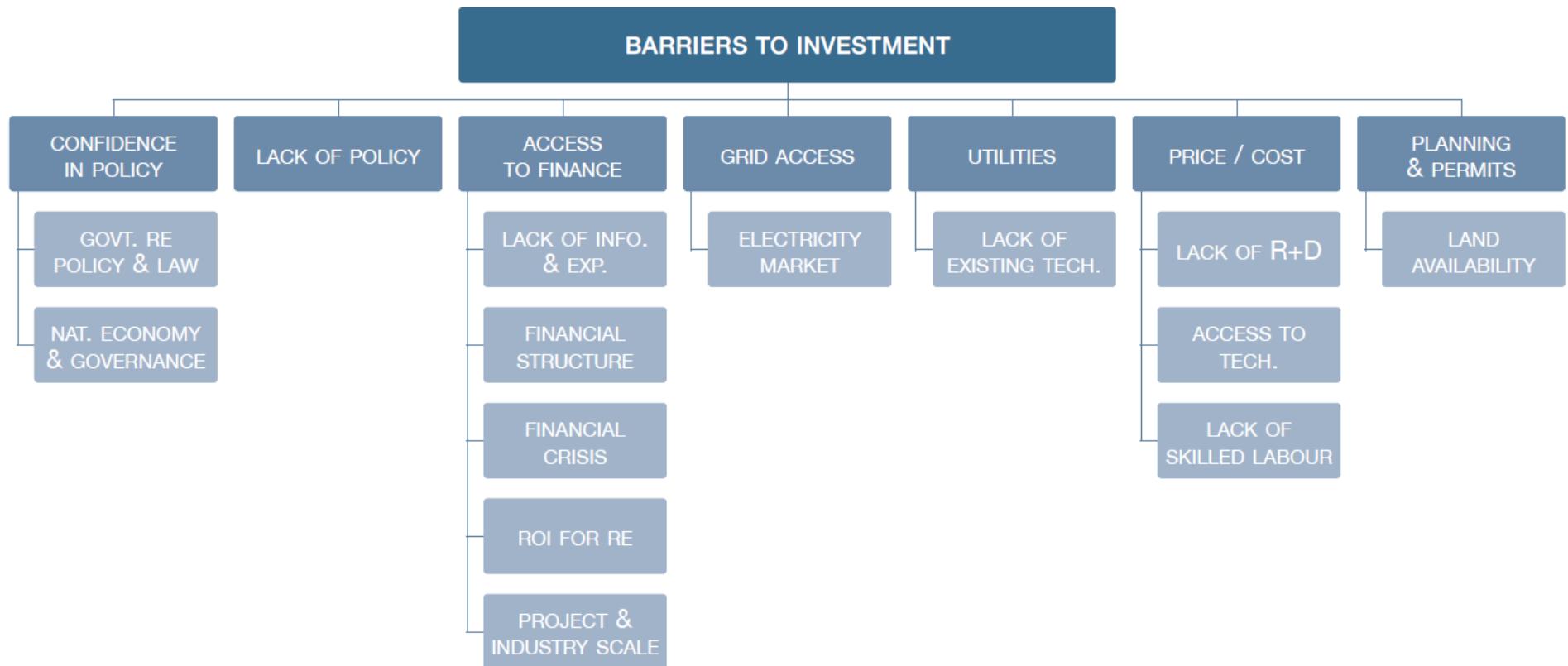
- Innovaties te benutten: drijvende PV, Agrivoltaics, PV/T,

- Afhankelijkheid van (PV-panelen) invoer
- Ontbrekende strategie om de markt gestaag te ontwikkelen

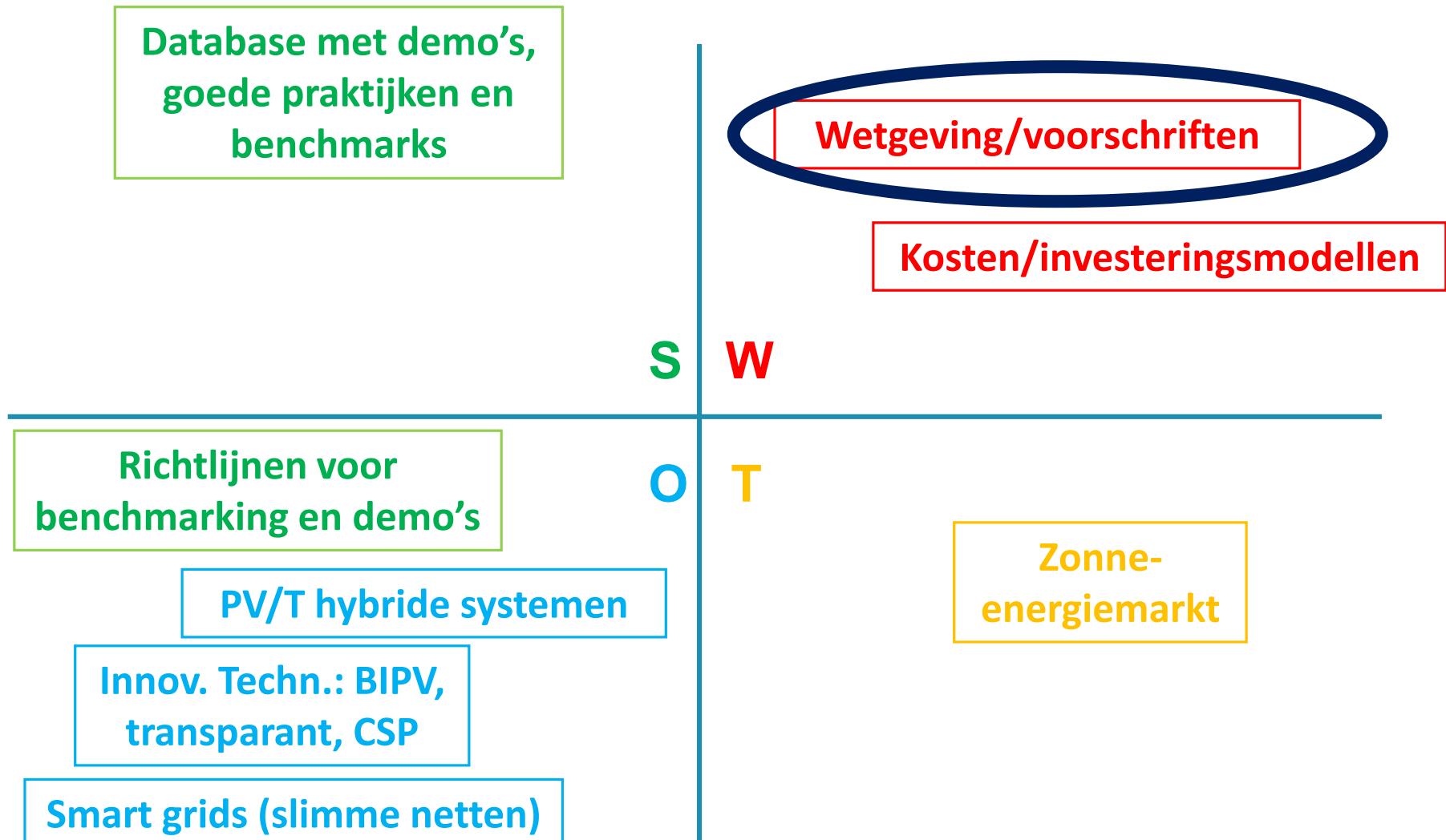
Kostenbesparing door RE-bronnen



Belemmeringen voor investeringen in RE-bronnen



Zonne energie in 2Zeeën gebied



Ondersteuning

Belgium

Source: EEA Eurostat 2019

	REGULATORY POLICIES					FISCAL AND OTHER STATE FUNDED INCENTIVES			
	Feed-in tariffs	Feed-in premiums 1)	Tenders	Quota obligation with Tradable Green certificates	Quota obligation without Tradable Green certificates	Net-metering/ net-billing	Investment subsidies	Tax credits mechanisms	Soft loans
RES-E									
- Offshore wind	x	x	x						
- Onshore wind			x				x		
- Solar PV	x		x		x	x			

Netherlands

	NON-FISCAL SUPPORT SCHEMES				FISCAL AND OTHER STATE FUNDED INCENTIVES				
	Feed-in premium (SDE+)	Tendering	Quota obligation with Tradable Green certificates	Quota obligation without Tradable Green certificates	Net-metering/ virtual net metering	Capital subsidy/ grants (e.g. ISDE) ⁴	Tax regulation mechanism I (EIA)	Tax regulation mechanism II (MIA/YAMI)	Soft loans
RES-E							x	x	
- Offshore wind	x	x					x	x	
- Onshore wind	x	x		x		x	x	x	
- Solar	x	x		x		x	x	x	x

France

	REGULATORY POLICIES					FISCAL INCENTIVE AND PUBLIC FINANCES			
	Premium tariff	Feed-in tariff (for < 500 kW plants)	Tendering	Quota obligation with Tradable Green certificates	Quota obligation without Tradable Green certificates	Net-metering/ net-billing	Capital subsidy, grants (Heat Fund and)	Tax regulation mechanism (Tax credit)	Loans
RES-E									
- Offshore wind	o		o						
- Onshore wind	o		o						
- Solar	o	o	o						

United Kingdom

	REGULATORY POLICIES				FISCAL INCENTIVE AND PUBLIC FINANCES			
	Feed-in tariff < 5MW	Premium tariff	Quota obligation with certificates system > 5 MW	Tendering	Net-metering/ net-billing	Capital subsidy, grants	Tax regulation mechanism	Loans
RES-E								
- Offshore wind	o	o						
- Onshore wind	o	o						
- Solar	o	o						

2 Zeeën – Zonne wetgeving/-regelgeving

Belemmeringen voor zonne-energie uitrol

- Onzekerheid van de ondersteuning/stimuleringsregelingen

Investeringsmaatschappijen en burgers niet zeker of het de moeite waard is om te investeren in zonne-energie

- Milieuplanning

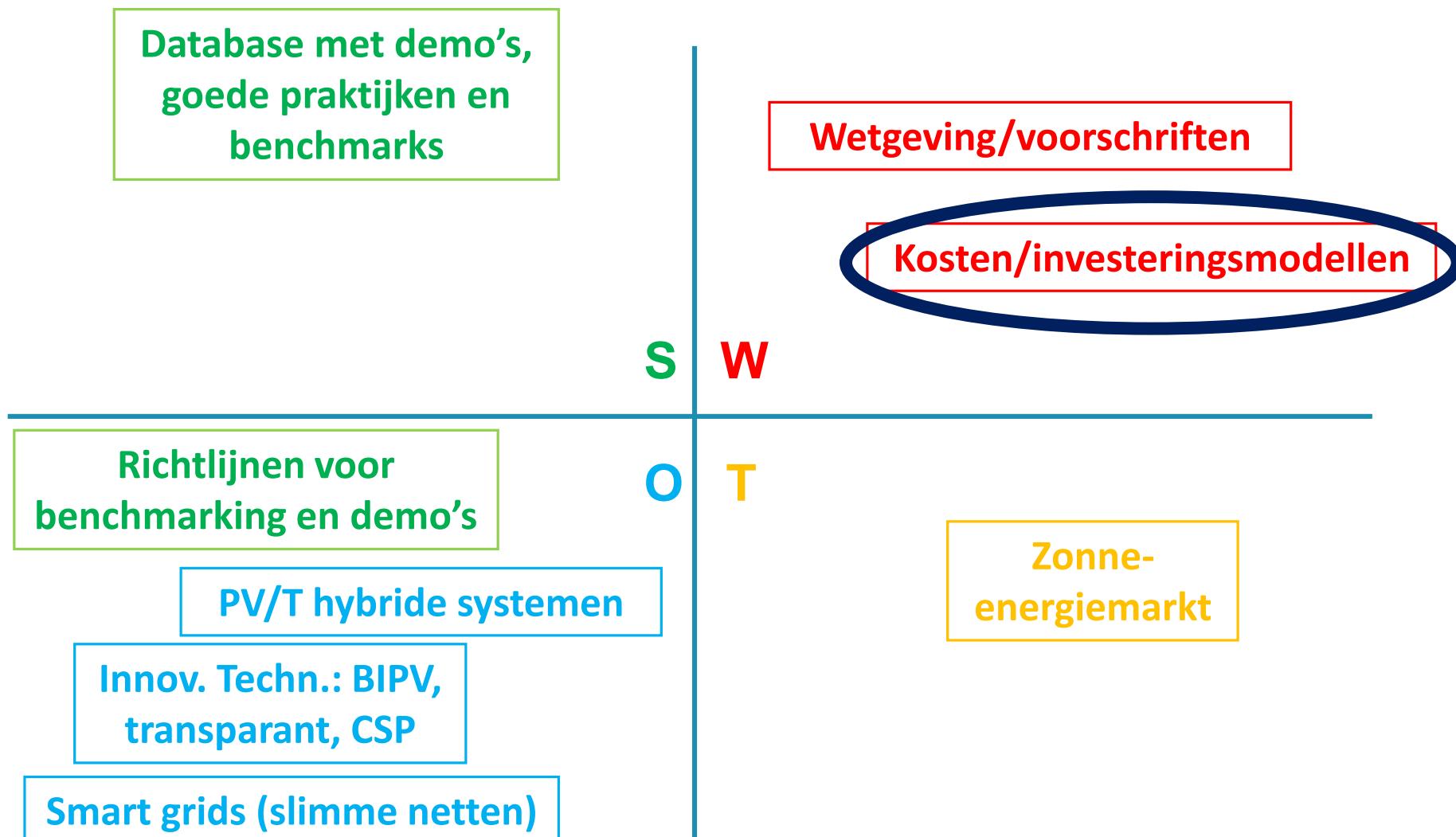
Specifieke voorschriften PV-syst op daken: bv historische gebouwen, monumenten

Milieuvaagstukken voor zonnefarms: behoud van biodiversiteit, landbouw

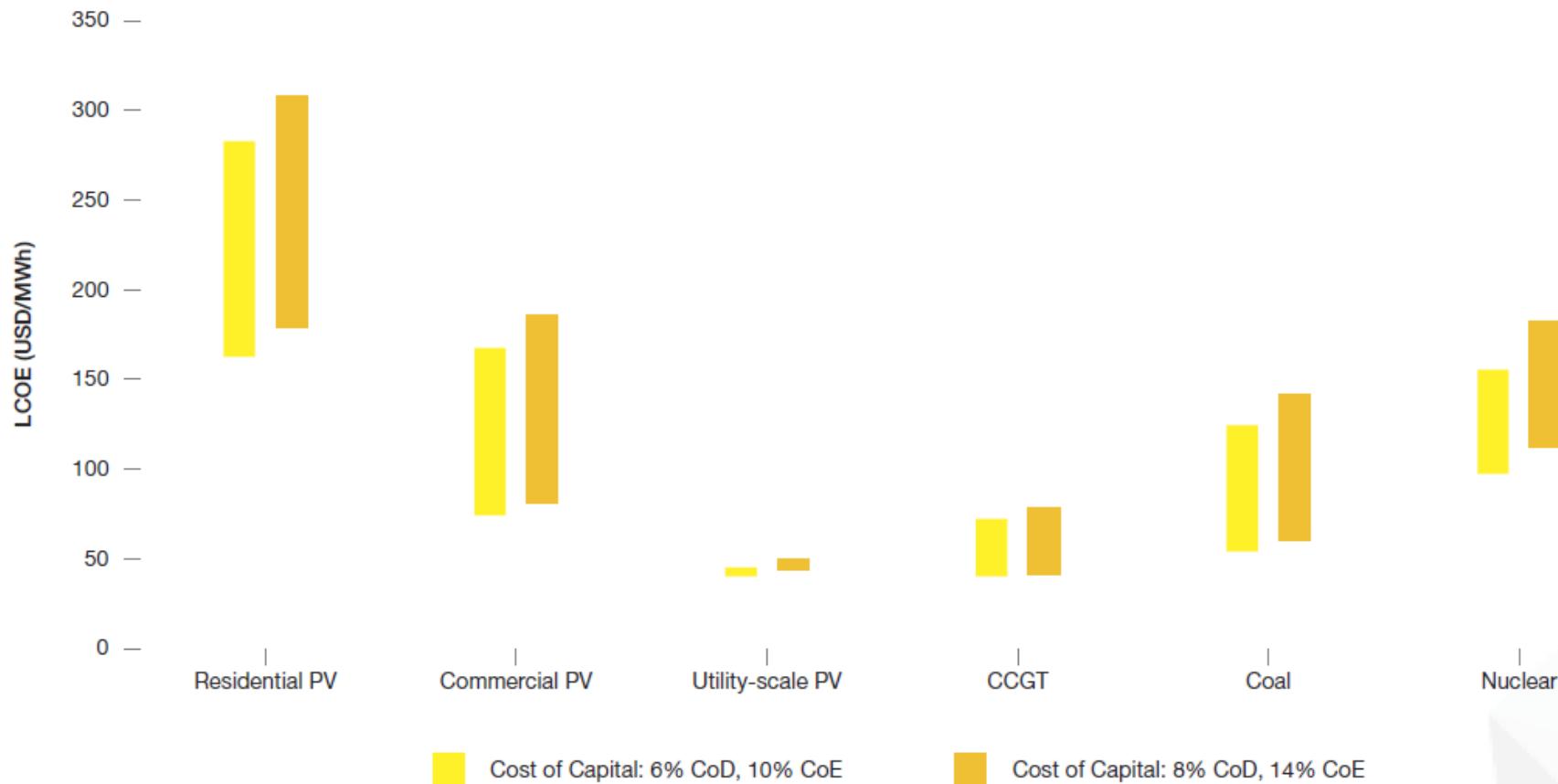
- Gebrek aan geïntegreerd klimaatbeleid

De verantwoordelijkheden zijn bv in België verdeeld over verschillende federale, regionale en lokale overheden.

Zonne energie in 2Zeeën gebied



2Zeeën – Kosten/investeringsmodellen



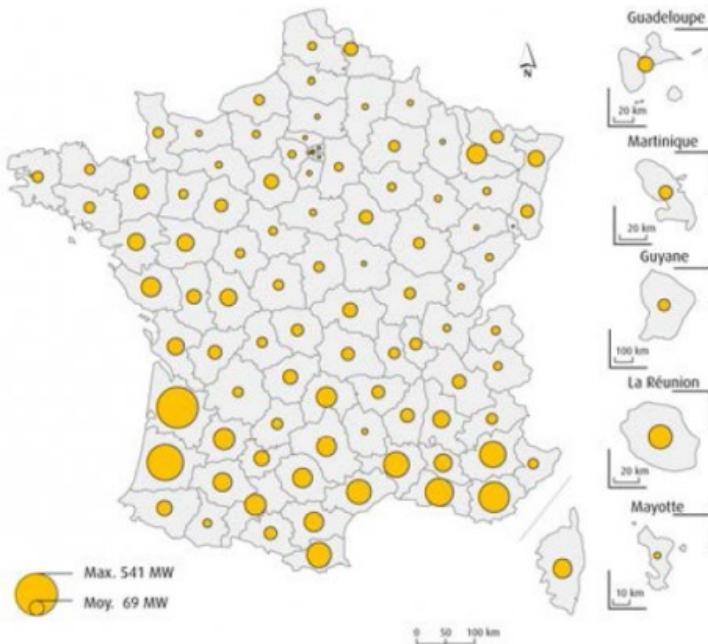
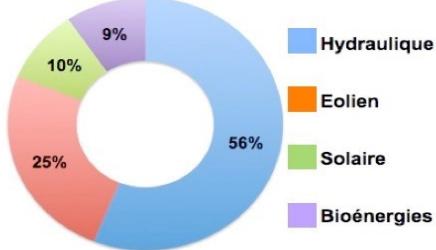
Source: Lazard (2017)

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Solar electricity generation costs in comparison with other renewables

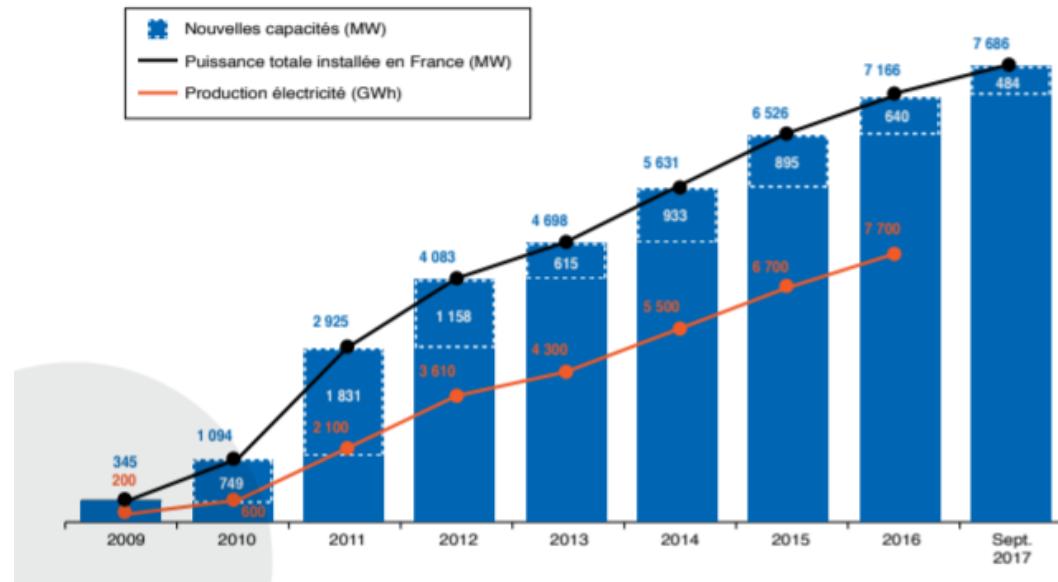
2Zeeën – Kosten/investeringsmodellen

La production française d'électricité renouvelable en 2017
(Source : RTE-Bilan 2017)



According to RTE, mainland France PV production reached 8,3 TWh in 2016. PV electricity represented 1,6 % of the electric consumption of mainland France in 2015.

Parc total photovoltaïque et production d'électricité annuelle en France
Source : Observ'ER d'après les chiffres du SDES



2Zeeën – Kosten/investeringsmodellen

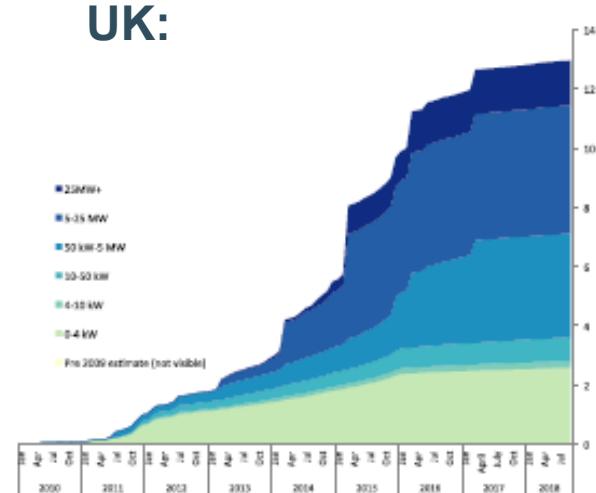
BELGIUM:

	2017 Numbers
Number of PV systems in operation in your country (a split per market segment is interesting)	<p>≤ 10 kVA: 459.854 systems</p> <p>> 10 kVA et ≤ 250 kVA : 7.009 systems</p> <p>> 250 kVA : 1.004 systems</p>
	TOTAL: 467.867

- Veel kleine installaties
- Residentieel/commercieel
- Geen fancy technologieën

FRANCE:

Number of PV systems in operation in your country	2017		
	Peak Power range	Installations (number)	Power (MW)
	0 – 3 kW	289 494	779
	3 kW – 9 kW	73 224	467
	9 kW – 36 kW	17 522	438
	36 kW – 100 kW	13 213	1 070
	100 kW – 250 kW	6 071	1 072
	> 250 kW	1 415	4 219
	Total	400 939	8 044
	Total Off-grid		30



2Zeeën – Kosten/investeringsmodellen

Stimulerende maatregelen/steunregelingen:

- Feed-in tarieven (FIT's)
- Net metering
- Slimme meters
- Groen/witte certificaten

Elementen voor succesvolle RE-ondersteunende maatregelen:

- een duidelijk, bankabel prijssysteem
- prioritaire toegang tot het net: duidelijke identificatie van de verantwoordelijke voor de aansluiting en stimulering van de aansluiting
- duidelijke, eenvoudige administratieve en bouwvergunningsprocedures.
- openbare acceptatie/ondersteuning.

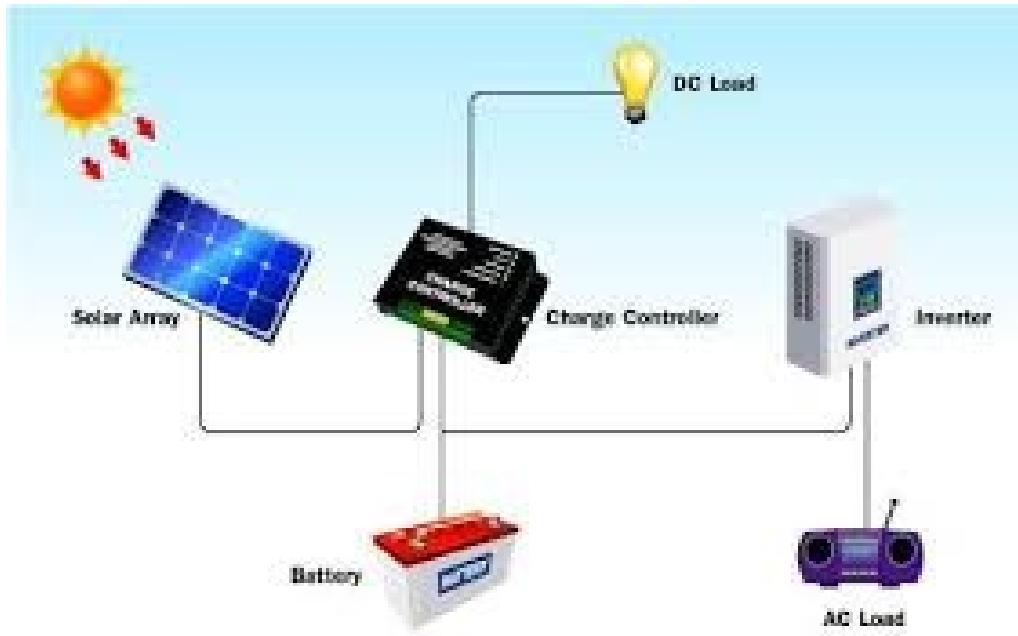
2Zeeën – Kosten/investeringsmodellen

Risicofactoren bij investeringen in duurzame energie:

- **Reguleringsrisico's:** ongunstige veranderingen in wet- en regelgeving, ongunstige tariefstelling en contract wijzigingen of breuken.
- **Bouwrisico's:** vertraagde of dure leveringen, het in gebreke blijven van een contractpartij of een ontwerpfout.
- **Financieringsrisico's:** bv noodzaak tot herfinanciering tegen minder gunstige voorwaarden, enz.
- **Operationele risico's:** defecte apparatuur, in gebreke blijven van een tegenpartij, verminderde beschikbaarheid van de zonne-energiebron

2Zeeën – Kosten/investeringsmodellen

Kosten (uitgaven) en opbrengsten PV-installaties

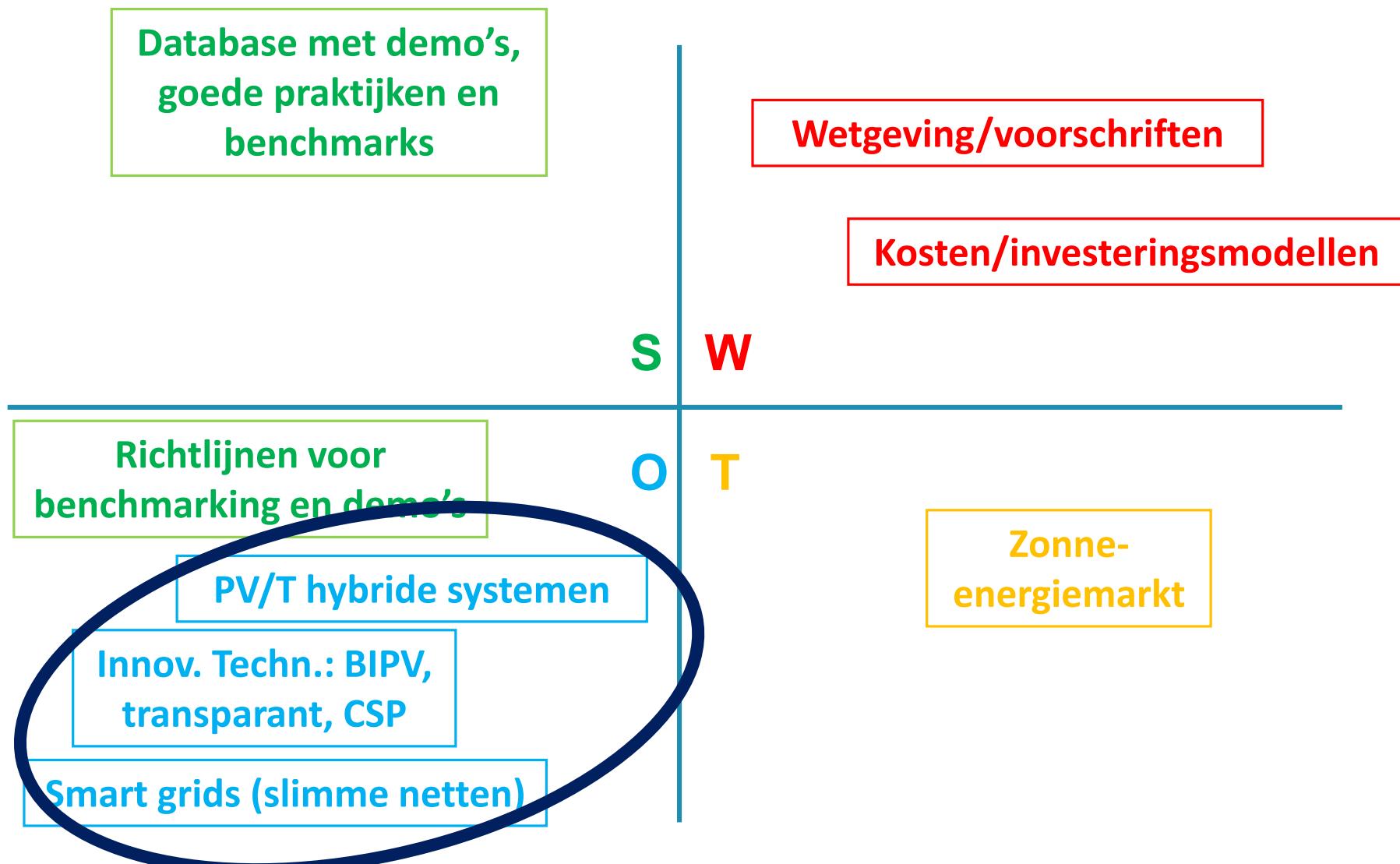


Initial costs + O&M + recycling +

+ land purchase (Solar farms)

+ roof reinforcement/renovation

Zonne energie in 2Zeeën gebied



2 Zeeën – Zonnetechnologie innovaties

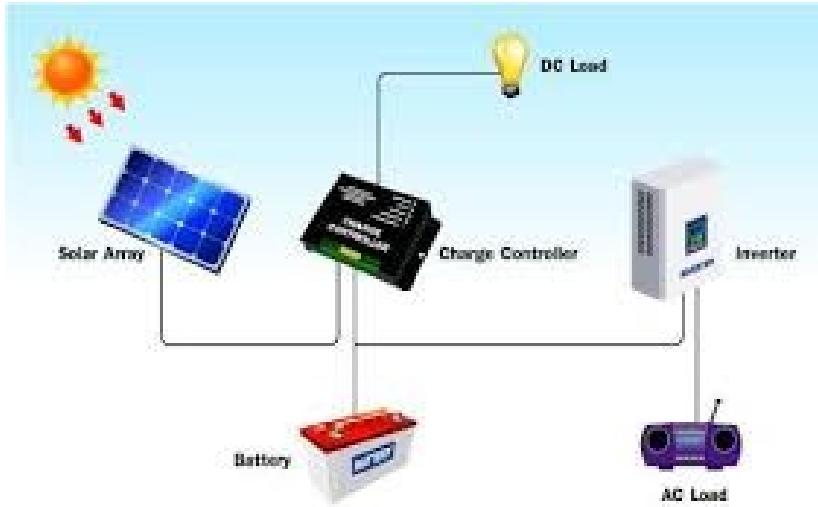


PV-modules (panelen) 50 % van de totale systeemkosten

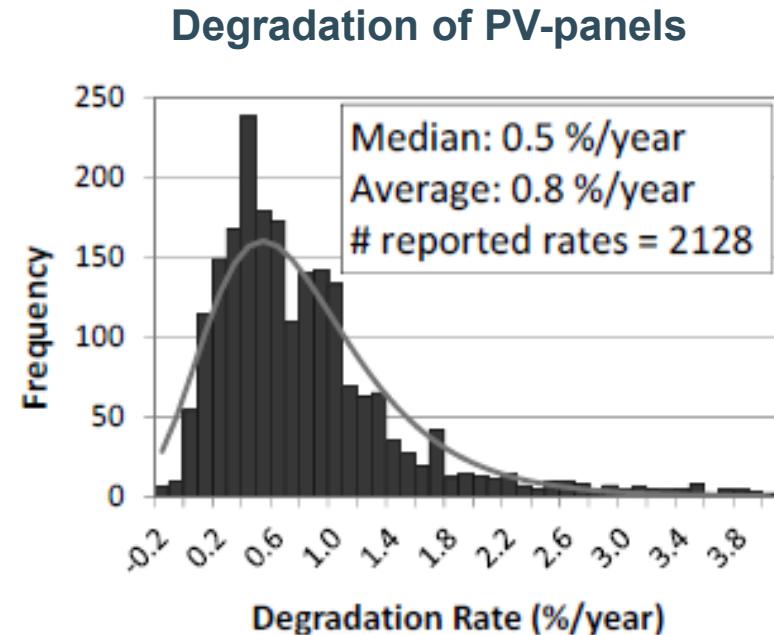
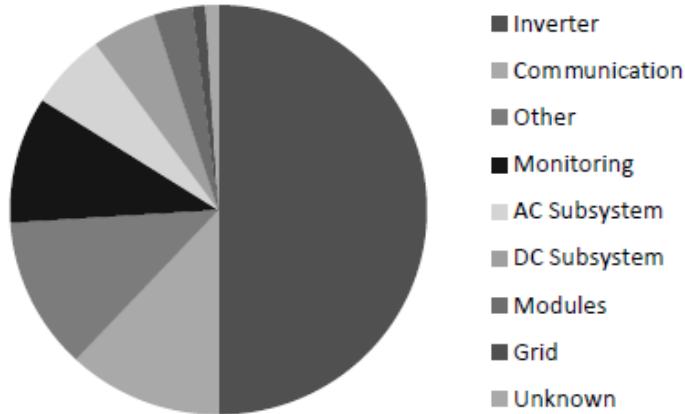


Technology	Drawbacks to future use
Crystalline-silicon	Efficiency, materials
Thin-film	Efficiency, stability, toxicity, lifetime
Concentrating PV	Stability, complexity, high cost
Organic PV	Efficiency, stability, lifetime
Third Generation PV	Efficiency, proof of concept only

2 Zeeën – Zonnetechnologie innovaties



Replacement costs (failure % in PV-installations)



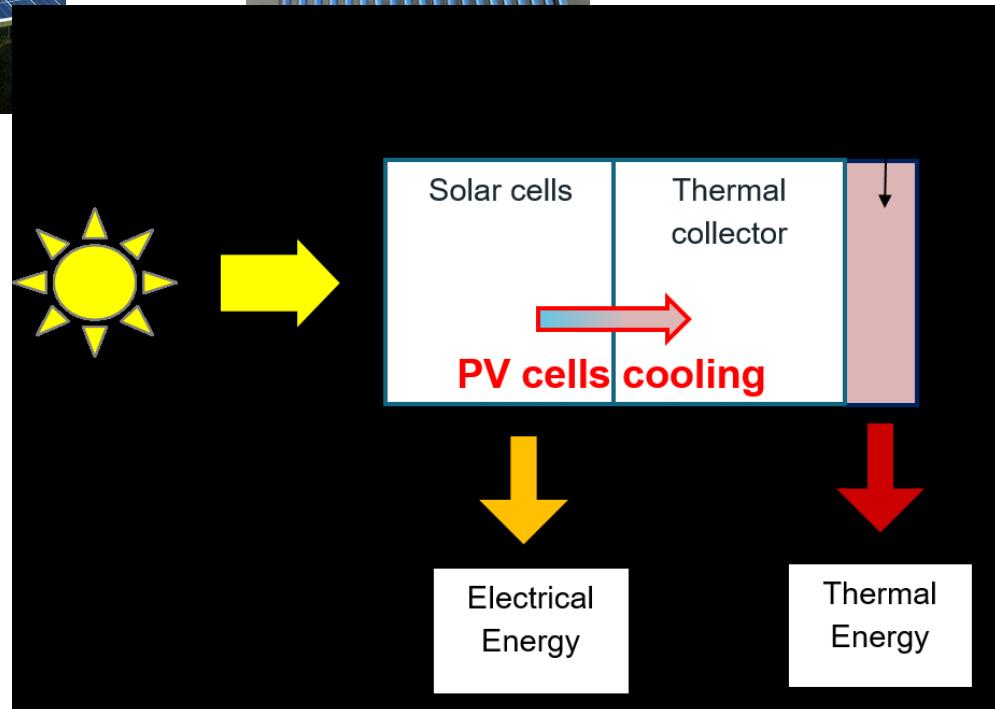
2 Zeeën – Zonnetechnologie innovaties

PV/T: working principle

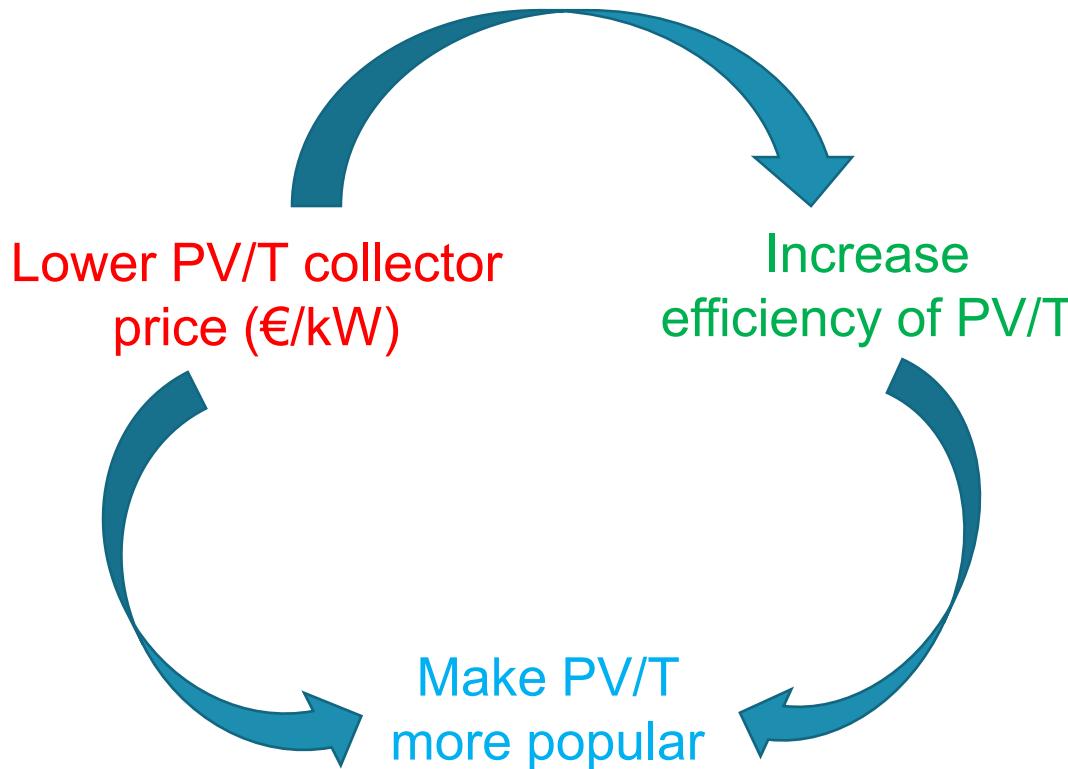
PV-array



Solar thermal collectors

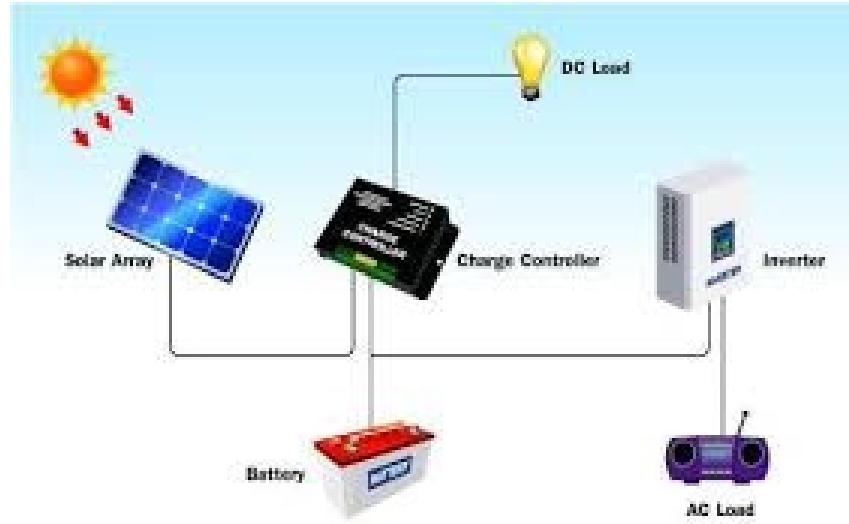


Uitdagingen bij PV/T uitrol



Uitdagingen of juist **kansen**?

2 Zeeën – Zonnetechnologie innovaties

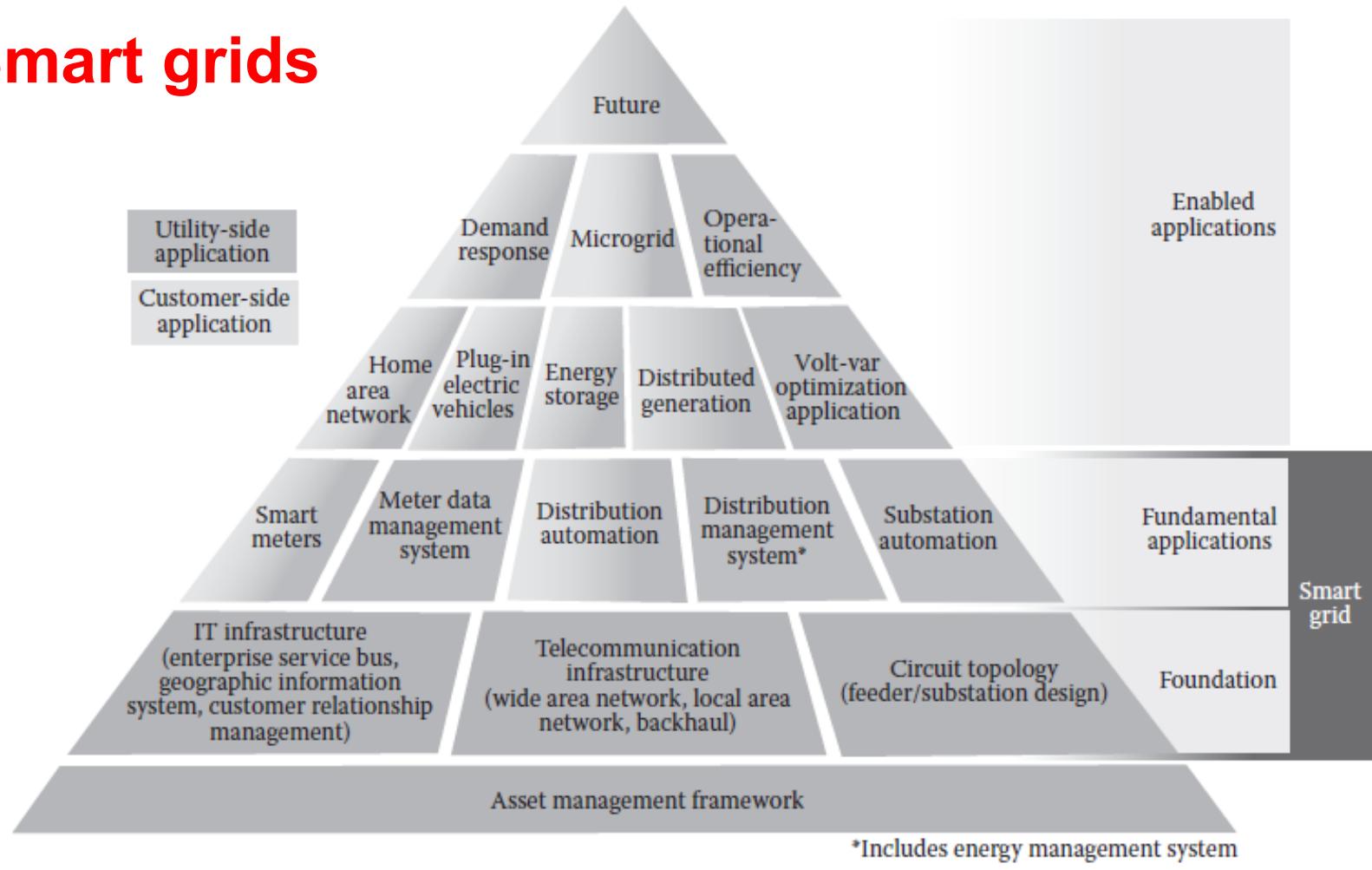


Vermindering van de kosten (EUR/kWh) betekent:

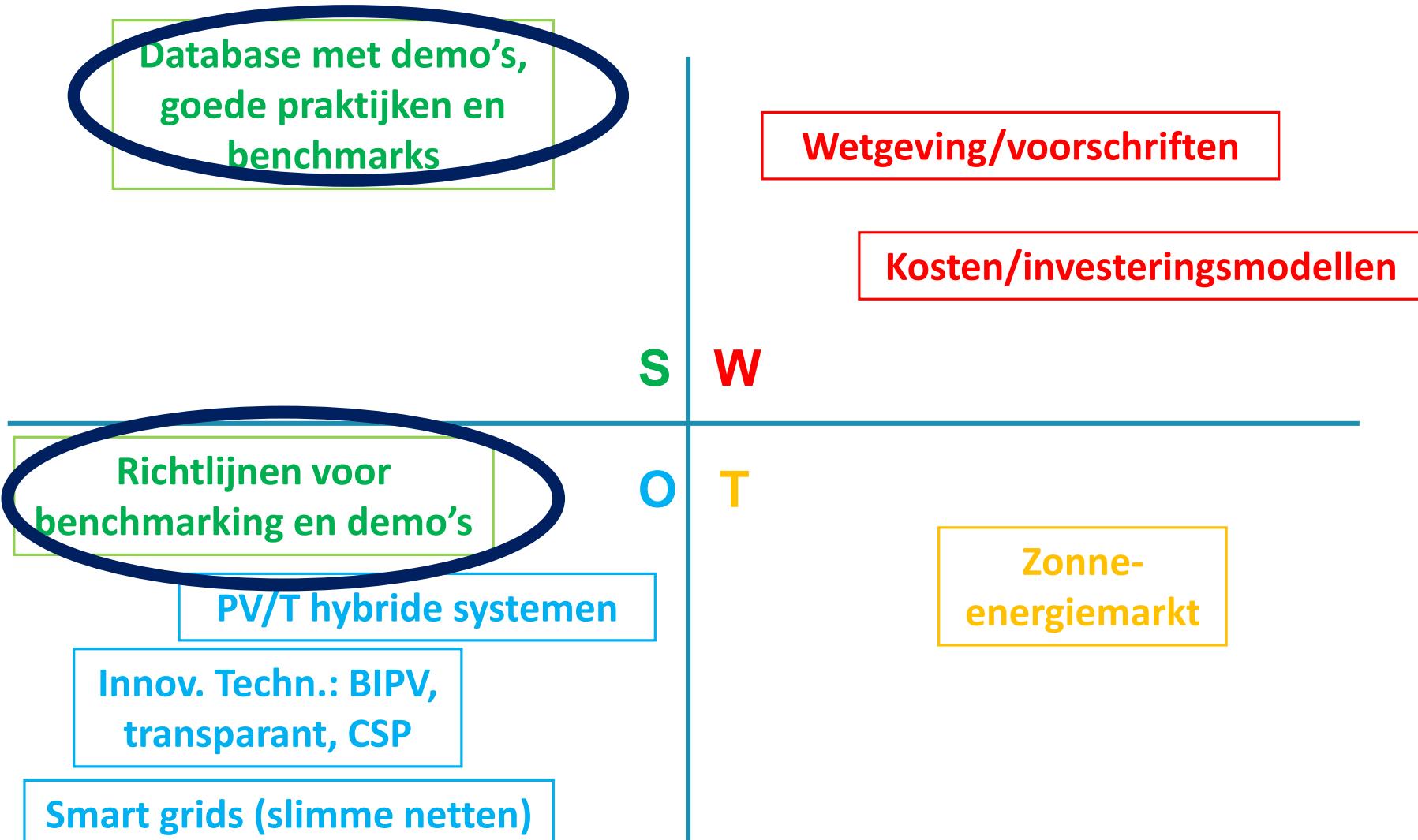
- het saldo van de systeemkosten (systeemcomponenten en installatiekosten) verminderen;
- de energieopbrengst, de stabiliteit en de levensduur van het systeem verhogen;
- de levensduur van de omvormer en de betrouwbaarheid van de systeemcomponenten verhogen;
- geen modules met verschillende specificaties in hetzelfde systeem combineren;
- de omvormers afstemmen op de modules en belastingsprofielen.

2 Zeeën – Zonnetechnologie innovaties

Smart grids



Zonne energie in 2Zeeën gebied



Richtlijnen voor
benchmarking en demo's

Database met demo's,
goede praktijken en benchmarks

(Nog) nodig in de 2 Zeeën-regio?



JA omdat

- Stakeholders zijn nog steeds niet op de hoogte van bestaande kennis/innovaties
- Verschillende belanghebbenden met verschillende achtergronden bestaan nog steeds naast elkaar
- Niet genoeg (best practices) voorbeelden dicht bij 'uw deur'.

2 Zeeën-regio – belemmeringen, best practices, ..

Belemmeringen voor consumenten - huishoudens, bedrijven en industrie:

- **Gebrek aan passende informatie** over kosten/verbruik, of beperkte transparantie in aanbod
- Toenemend aandeel van de **netwerk tarieven/belastingen/heffingen** in de gemiddelde elektriciteit eindafrekening.
- **Onvoldoende concurrentie** op veel retailmarkten, een gebrek aan beloning voor actieve deelname en moeilijkheden bij het overstappen werken ontmoedigend.
- **Onvoldoende ontwikkelde markten** voor residentiële energiediensten en vraagrespons
- **Het voorkomen van zelf-generatie en zelf-consumptie** vermindert de potentiële winst.
- **Ongelijke toegang tot informatie en hoge toetredingsdrempels voor nieuwe concurrenten** vertragen de invoering van beschikbare geavanceerde technologieën en praktijken zoals **slimme meters, slimme apparaten, gedistribueerde energiebronnen en verbeteringen van de energie-efficiëntie.**

Solarise database

SOLARISE benchmarking and pilots. The main information below has to be obtained **from trustable sources, be anonymized and still able to preserve some characteristics that make it country/region specific.**

1. Name of the project
 2. Start year of operation
 3. Address of the project
 4. Type (Houses / Commercial / Industrial building / Residential Building / Public building / Solar farm)
 5. Installation Type (Rooftop flat / Rooftop inclined / Wall / Ground)
 6. ...
-
20. How is the produced energy measured /accounted in the energy bills (Net metering or Smart metering)
 21. Type of solar inverters (Central Inverter, 1 for all the panels / String Inverters, 1 per string of panels with or without DC optimizers / Micro – Inverters, 1 micro-inverter per panel)

Initial Costs of the installation (EUR)

1. Solar PV installation
2. Renovation of building roofing/wall

Operation and management (O&M) and annual costs during first year and base year (EUR)

1. Annual Grid-related costs (transport & other)
2. Annual Maintenance and planned replacements.....

Subsidies and revenues (EUR)

1. Subsidies at installation
2. Other incentives and subsidies (cumulative since operation date)
3. Revenues (cumulative since operation date)

Solarise database

Link	Functions	Access Option
https://navigator.irena.org/index.html	Provide a quantitative overview of solar PV installations without any qualitative way. But it gives the link to several interesting tools.	Free access
http://www.polis-solar.eu/	Provide a strategic approach by the municipality can enhance the expanding integration of small-scale, decentralized energy applications into the built environment.	Free access
https://solargis.com/	Provide reliable and accurate solar, weather and solar electricity data that are used in the whole lifecycle of solar power plants, from prospection to development and operation	Free trial version; software should be purchased.
https://www.energysage.com/solar/solar-operations-and-maintenance/solar-monitoring-systems/	An interesting tool that gives an deep economic analysis of a future solar installation. However, it is only valid for USA.	Free access
https://www.renewables.ninja/#/country	Provide the potential of solar energy of a location in a global way	Free access
https://open-power-system-data.org/background/	Provides an open platform for data required by energy system	Free access
https://www.data.gouv.fr	Provides global data of the installed PV and wind power in France	Free access
http://re.jrc.ec.europa.eu/pvg_tools/en/tools.html	This tool allows evaluating performance of grid-connected PV plant.	Free access

Table Useful tools for solar installations post-evaluation

Solarise – collected best practices

Bestuur en participatie van belanghebbenden (burgers, eindgebruikers)

- Algemene informatie over het project
- Participatief bestuur
- (Participatieve) ontwikkeling

O1. Guide package on legislation, market, technologies and best practices



PV Best practices
Criterion : Governance, participation
Title : Local Energy Strategy (LES)



General information about the solar installation :
Country : the Netherlands
City : Heerhugowaard
Owner : -
Date [works, putting in service, investiture...] : in progress
Price : -
Type of solar energy : -

Governance and participation at developing the LES

While Heerhugowaard, with the Suncities «Stad van de Zon» solar-energy project, is already performing well, the new local energy strategy (LES) also is focusing on solar energy as one of the main components. Governing the increase of solar-energy capacity, a so-called solar-ladder is applied, which basically names approx. 140 MWp of roof-top solar-PV capacity as base that needs to be harvested first and may be at a later point followed by solar-PV projects around infrastructural facilities or even a new solar-PV farm. Hybrid solar-PV-warmth project are named possibilities for individual houses. This solar-ladder aims to prevent using valuable and limited farm-lands for solar-installations. Further, different scenarios for meeting the future energy-demand are developed within the LES, which are scored along a scoring matrix that aids in governing the energy-transition in Heerhugowaard and making good and informed choices. However, aiming at fully meeting local demand from wind and solar-energy, large scale installations are named as being inevitable in the city since this provides the biggest potential capacity. Given the high importance of citizens in the energy transition is the LES painting the general picture while the concrete realization that also includes participation of citizens is following the LES in a roadmap that is to be developed once the LES is finalized. Finally, the important step of storage will be also picked up in this roadmap.



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Solarise – collected best practices

Architectonische integratie PV-installaties op daken of in wijken

- Algemene informatie over het project
- Innovatieve elementen

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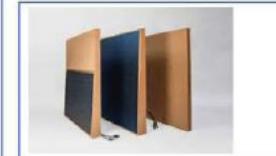
PV Best practices
Criterion : Architectural Integration solar PV
Title : Kuijpers Helmond



Interreg
2 Seas Mers Zeeën
SOLARISE
European Regional Development Fund

General information about the solar installation :
Country : The Netherlands
City : Helmond
Owner : Kuijpers Installatie BV
Date : 2018
Price : undisclosed
Type of solar energy : Esthetical façade with integrated photovoltaics and programmable LED

Description of the installation :
In this project an attempt was made to fully design a façade that combines multiple functionalities. Number one functionality is the façade design itself. Besides meeting all building regulations and standards and protecting the building from the weather and environment, a façade gives a building a certain identity. Design freedom for architects is of crucial importance. By embedding programmable LEDs in the façade the building can be illuminated in a color matching the seasons. Finally, PV is embedded to generate electricity. By primarily focusing on the other functionalities of the façade, the PV itself is a last 'addon' to the façade that can be integrated with little additional costs.



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Solarise – collected best practices

Zelf-consumptie en slimme systemen om pieken en overproductie te verminderen

- Algemene informatie over het project
- Technische details slimme systemen

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PV Best practices
Criterion : Self-consumption
Title : PV installation on a private company combined with charging of electric vehicles

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2 Seas Mers Zeeën
SOLARISE
Cross-border Regional Development Fund

Map : location of the installation in the 2 seas region (location in West-Flanders, Belgium)



General information about the solar installation :

Country : Belgium
City : Roeselare
Owner : Private company
Date (works, putting in service, investiture...) : to be installed
Price : 145.340 Euro TVA excluded
Type of solar energy : PV panels

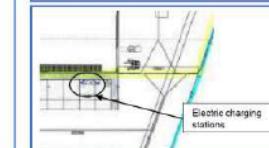
Description of the installation :

Technical details :
A PV installation of 134 kWp can be installed on the roof. The auto self consumption is estimated to be 59%. The electricity produced by the solar panels is only 36% of the total electricity use of the company.

Financial details :
- Investment cost : 145.340 Euro TVA excluded
- Project-IRR : 9,8%
- Benefit after 20 years : 165.277 Euro TVA excluded

Smart system to reduce peaks and overproduction :
The company has 2 charging stations for electric cars. In total 3 employees use them to charge their electric car. The charging stations can also be used by 1 one visitor. Eventual overproduction can be used to charge the electric cars.

General placement of installation



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Solarise – collected best practices

Economische, niet speculatieve, winstgevendheid van zonne-energie

- Algemene informatie over het project
- Economische/financiële en technische details systemen

O1. Guide package on legislation, market, technologies and best practices



PV Best practices
Criterion: Smart, Grid connected
Title: Future solar photovoltaic installation at the campus of the University of Picardie Jules Verne (UPJV)



Interreg
2 Seas Mers Zeeën
SOLARISE
European Regional Development Fund

General information about the solar installation:
Country: France
City: Amiens
Owner: UPIV
Date: Installation will start in 2020
Estimated Price: € 163 685
Type of solar energy: PV Solar Panels

Description of the installation:
Technical Details:
Installed Capacity: 111 KWP
SMA Inverters: 7x20 KW
Type: building Integrated
Solar Panels Surface: 715 m²
Orientation of Panels: South Facing
Number of panels: 427
Expected Annual Energy Production: 103.9KWh
Income: €15,000 per year expected
CO₂ Emission Reduction: 6.7 Tons expected
Return on Investment time: 16 years
Smart Systems:

1. The installation can reduce the peak load on local grid in Amiens.
2. Battery storage system can also be used.
3. The installation allows self-consumption and power export to grid.
4. Possibility to get subsidies from the French local authority.



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Solarise – collected best practices

Zichtbaarheid van PV-systemen in de openbare ruimte en in het onderwijs

- Algemene informatie over het project
- Technische details systemen
- Gebruik voor onderwijsdoeleinden

01. Guide package on legislation, market, technologies and best practices



PV Best practices
Criterion : Visibility PV-installations public spaces and in education
Title : Future Solarise living-lab at KU Leuven – TC Ghent



General information about the solar installation :
Country : Belgium
City : Ghent
Owner : KU Leuven – Technology campus Ghent
Date : to operate starting on 2020
Price :
Type of solar energy : various kinds of small PV-installations

Description of the installation :

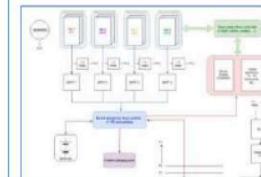
This Solarise living lab at KU Leuven TC Ghent is meant to be a sociotechnical imaginary where state-of-the-art and state-of-the-practice solar technologies can be shown, demonstrated, experimented and learned (theoretically and practically) by various stakeholders : students, installers, policymakers, general public.



Specific features :

- small installations with 2-3 panels per system to allow combination of hybrid PV/T, transparent, bifacial PV-panels, etc. with various inverters (solax, SMA, ...)
- accurate metering and monitoring of all parameters with own metrolgy
- easy access on roof, possible use of walls for BIPV and flexible control of installations
- visualisations through educational tools
- grid-connected system of max. 5 kWp
- rain water collection and use for building heating through hybrid PV/T solar panels
- education facilities for hands-on trainings and tests

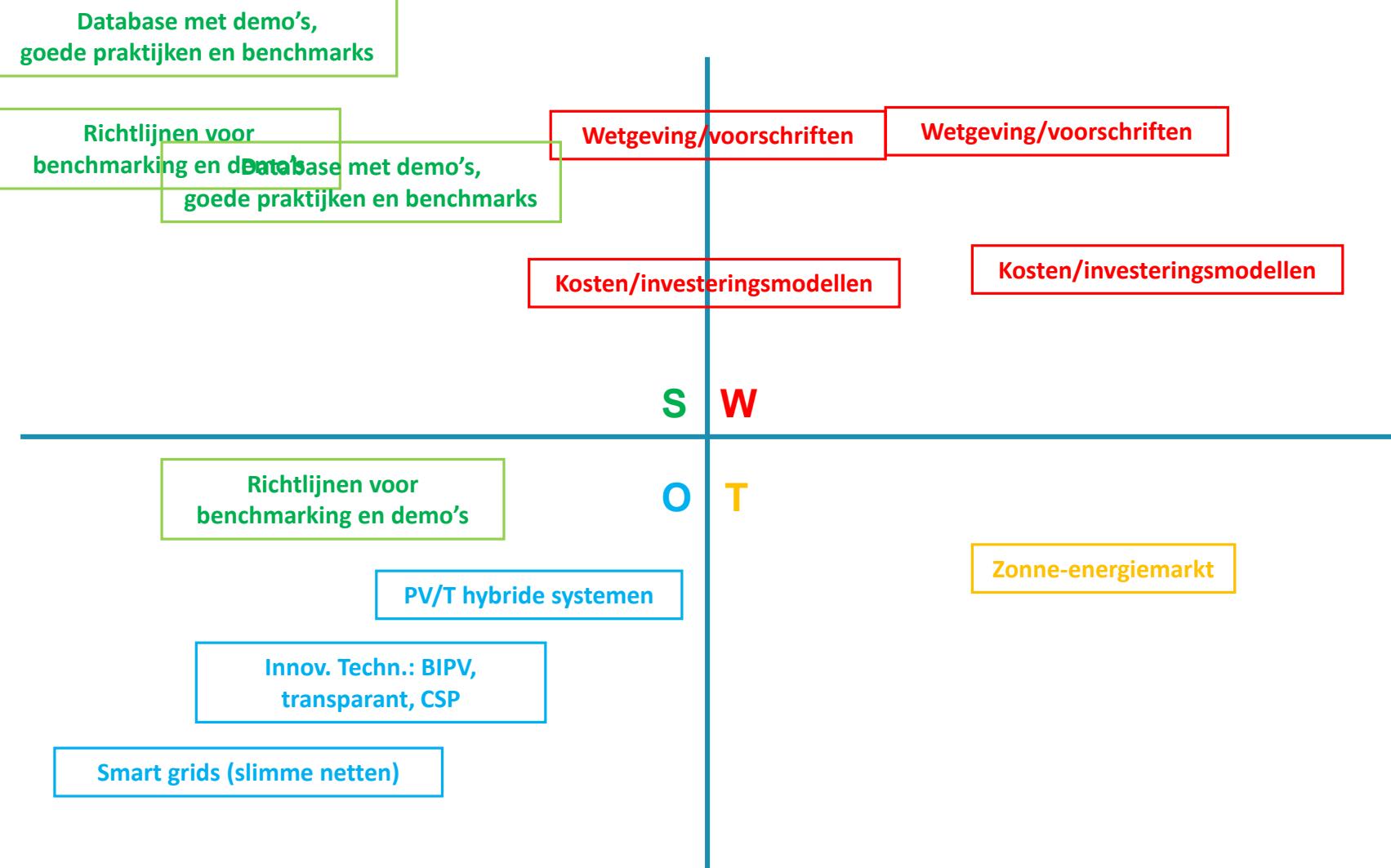
The temporary building hosting the living-lab (living units from recycled sea containers) will be replaced by a modular, flexible building developed in CBCI -2Seas project (Circular Bio-based Construction Industry) using with new construction materials and techniques.



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SWOT – Zonne-energie na Solarise



O1. Guide package on legislation, market, technologies and best practices

OUTPUT 1. Guide package on legislation, market, technologies and best practices

Document elaborated by KU Leuven
Based on the WP1 deliverables and the contributions from consortium partners

Note: This public document may be extended and improved during the project lifetime to include more recent information and/or relevant information obtained within the Solarise project. Any comments and suggestions for regarding the content of the document may be sent to Emilia Motoasca: emilia.motoasca@kuleuven.be

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Raadpleeg/download Output 1
en vul het evaluatieformulier in
op de Solarise-website:
<https://www.interregsolarise.eu/>

Bedankt voor jullie aandacht!