Flavours of Energy Communities

Ludwig Karg, B.A.U.M. Consult München / Berlin

Leen Peters, Th!nk E

Andreas Tuerk, Joanneum Research

Program

13:00 Welcome and Introduction
Michael Hübner, Hemma Bieser

13:10 Energy Communities – a means to an end
Leen Peters

13:20 The Task Force on Energy Communities
Ludwig Karg

13:30 Examples for the 10 flavours of Energy Communities

15:30 How you can you contribute to the European Task Force
Ludwig Karg, Leen Peters, Andreas Türk

15:45 Wrap-up and Closing
Michael Hübner, Hemma Bieser

Flavours of Energy Communities 23/04/2020 2

Leen Peeters

Th!nk E

Ophemstraat 140
3050 Oud-Heverlee
Belgium
Leen@think-e.be
www.think-e.be

Ludwig Karg

B.A.U.M. Consult

Gotzingerstr. 48/50
81371 München
Germany
L.Karg@baumgroup.de
www.baumgroup.de

Andreas Türk

Joanneum Research

Science Tower, Waagner-Biro-Straße 100
8020 Graz
Austria
andreas.tuerk@joanneum.at
https://www.joanneum.at

Energy Communities – a means to an end

Leen Peters, Th!nk E

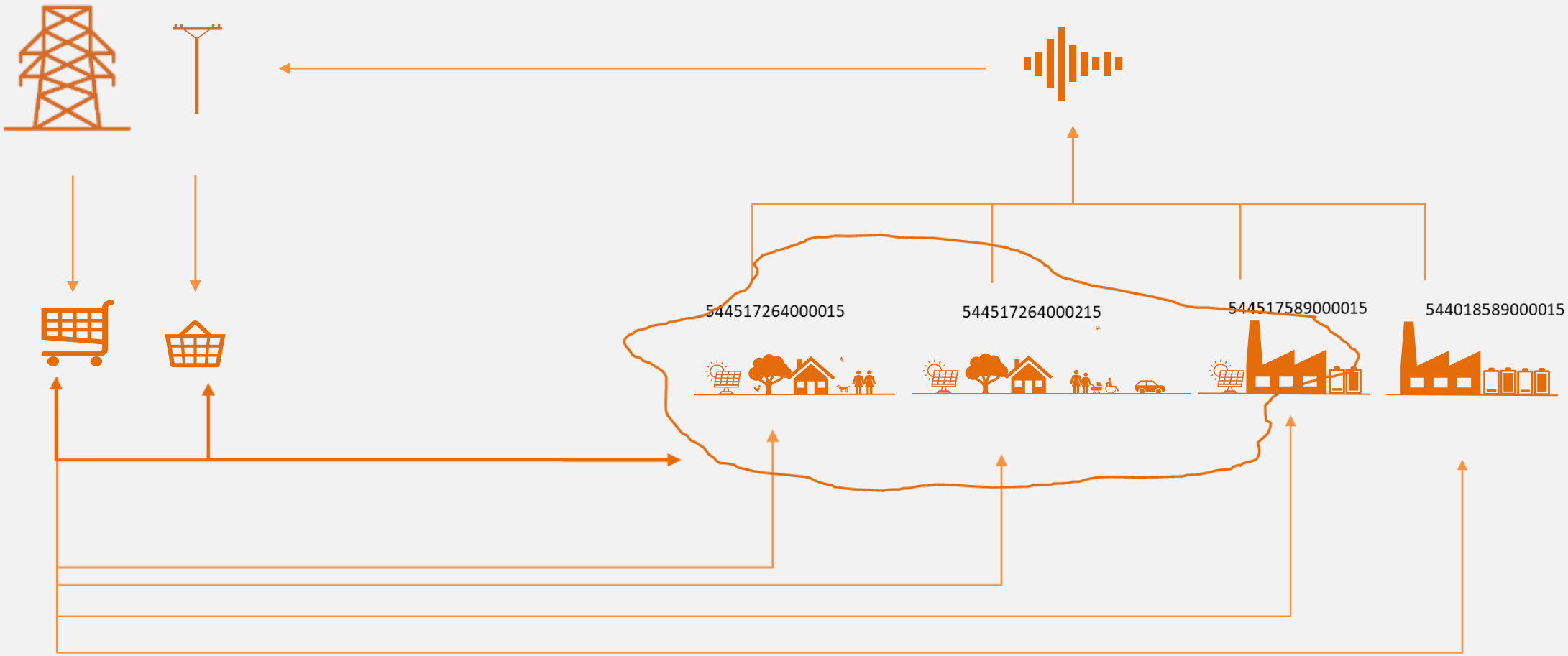
Energy Communities as a part of the Clean Energy Package

Art. 22 of the Directive on the promotion of the use of energy from renewable sources on "Renewable Energy Communities" (RED)

national transposition by June 30, 2021

Art. 16 of the Directive on the Internal Market for Electricity Directive on "Citizen Energy Communities" (EMD)

national transposition by December 31, 2020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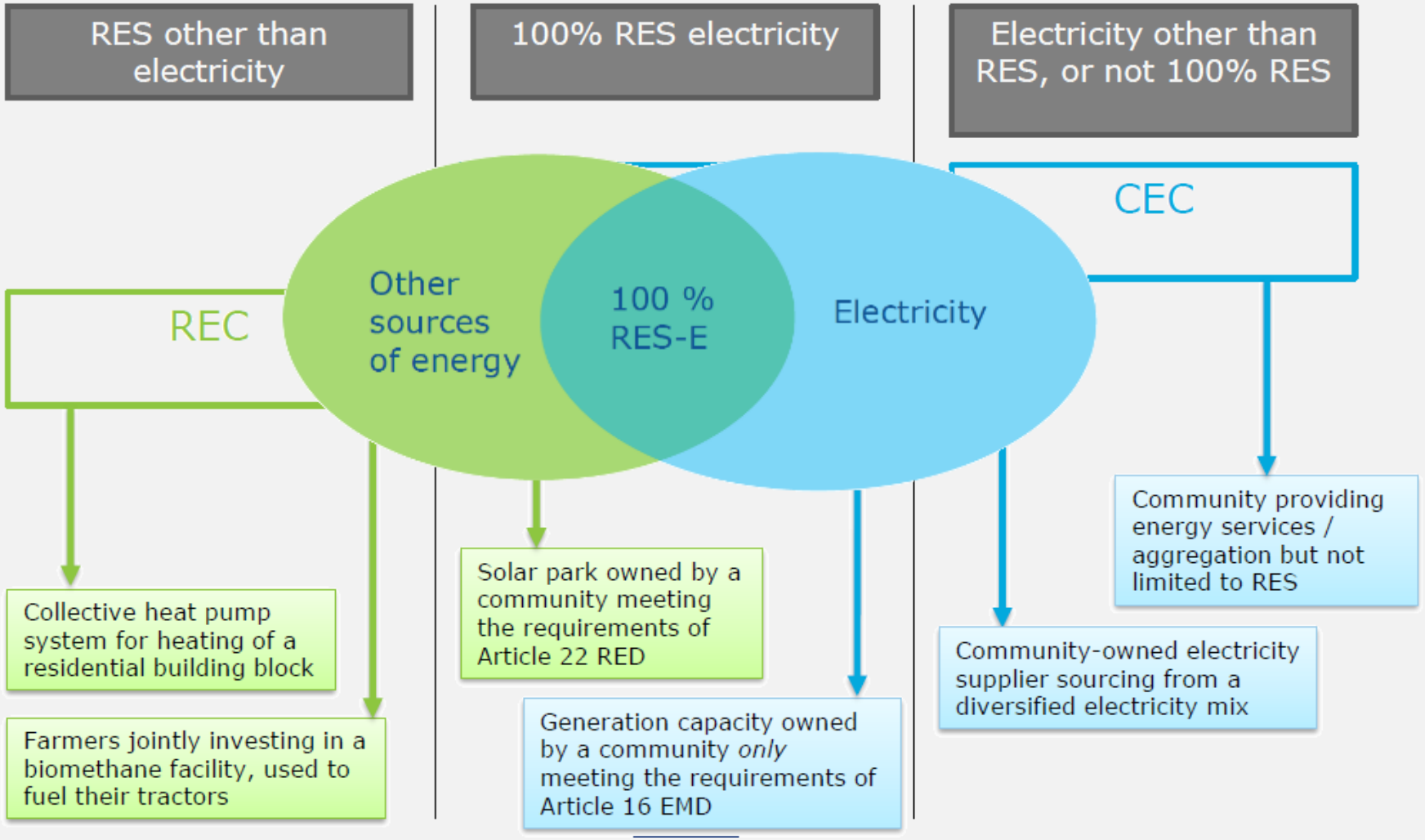
Objectives of Renewable (REC) and Citizen (CEC) Energy Communities

- Provide environmental, economic or social community benefits for members or the local area by ….
- Empowering citizens, engaging SMEs and public authorities
  - tool to increase public acceptance of new projects
  - tool to mobilise private capital for energy transition
  - a tool to increase flexibility in the market

Relation of REC and CEC



Key characteristics of REC and CEC

Participation and Governance	only non-professional actors, control remains with members located in proximity

Participation and Governance	open to all kinds of entities, but control remains with non-professional actors

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Active policy	Promote and facilitate the development of RECs Elimination of barriers

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Charges, taxes and fees	Respect for the Member States' autonomy

Key characteristics of REC and CEC

Participation and Governance	only non-professional actors, control remains with members located in proximity
Active policy	Promote and facilitate the development of RECs Elimination of barriers
Role in support schemes	Member States to take specificities of RECs into account when designing support schemes

Participation and Governance	open to all kinds of entities, but control remains with non-professional actors
Charges, taxes and fees	Respect for the Member States' autonomy
DSO status	Member States may allow the DSO status, possibility of "closed DSO" status

CEC/REC, flexibility management and behavior conducive to the grid

- Provision of (grid supportive) services can be the competency of CEC and REC (”provide other energy services“)
- EMD also decribes the role of the aggregators
- CEC can aggregate flexibilities, use them itself or market them (see projects GOFLEX, Interflex, Platone, FEVER, AlpGrids, …)

The Task Force on Energy Communities

Ludwig Karg, B.A.U.M.

Taskforce on Energy **Communities**

- Crosscutting work in the framework of Bridge
- What happens in the different MSs?
  - Good and inspiring examples
  - Analysis on legal existing and upcoming framework
- Recommendations expected
  - Replicability and upscaling needs and potentials
  - Research and demonstration needs
- Working Group “Regional Matters” with Taskforce “Local Energy Communities”
- Knowledge Generation from and for JPP SES projects
- Spotlights and Policy Briefs
  - for academia
  - funding programs
  - legislation (on MS level)
  - practitioners (energy, ICT)

Topics (identified by core-team of taskforce)

1. What are Energy Communities?
2. Which potential for renewable energy use can be triggered by a CEC or REC in addition to existing organisations?
3. What would be benefits and options for a CEC to operate its own (sub) grid?
4. What are benefits of CEC or REC in relation to existing means and measures of citizen involvement?
5. Which overall cost savings can be expected from CECs compared to existing schemes?
6. What are feasible tariffs to allow for the implementation of a CEC as part of the overall energy system?
7. How can candidates be supported to establish a CEC or REC?
8. What are requirements to ICT solutions for the implementation of a CEC or REC?
9. How can data collection and management be limited and data security be ensured in a CEC or R
10. What is the national situation of Energy Communities in the context of the CEP?

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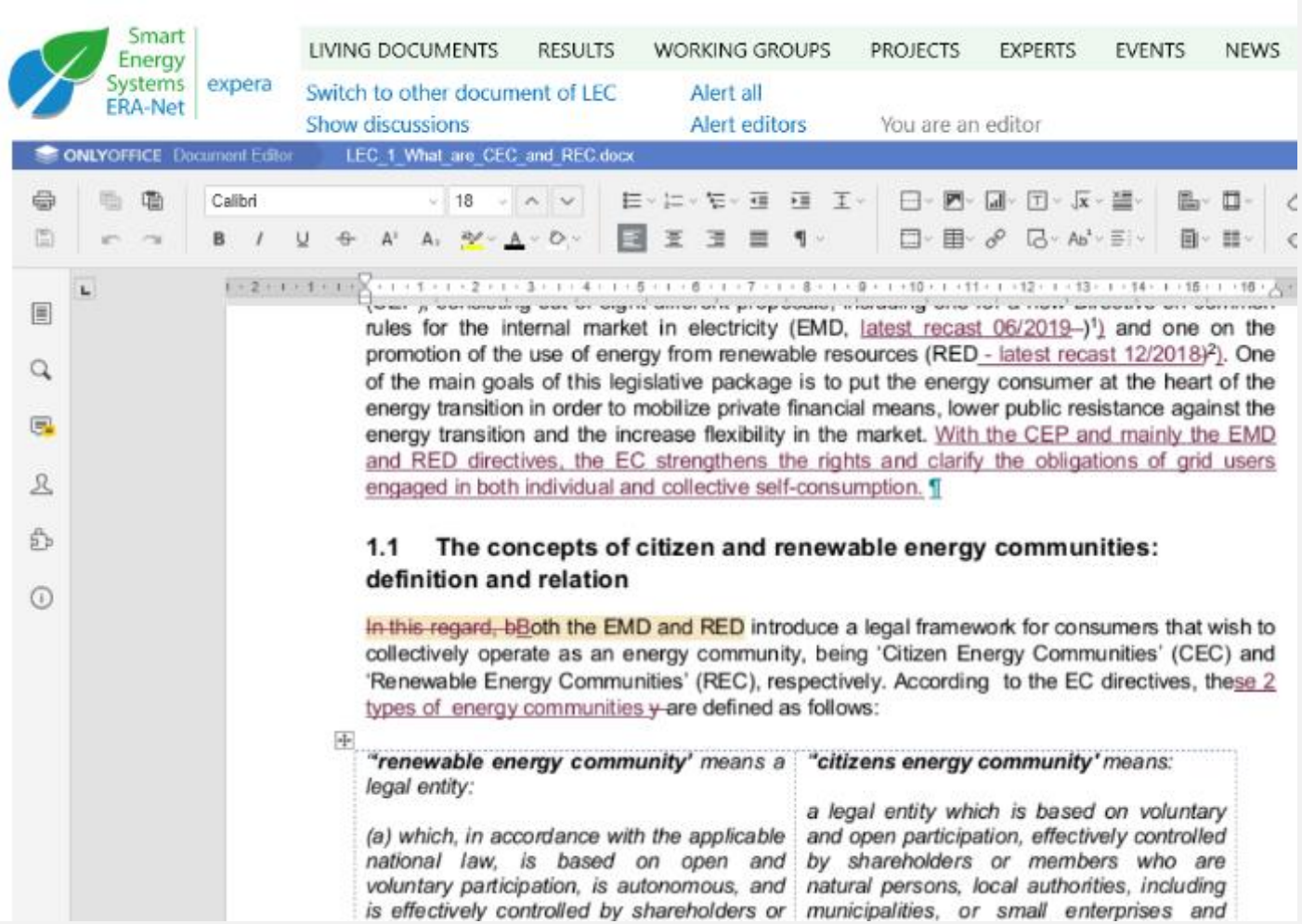
11. Cases and Experiences
12. Conclusions and Recommendations

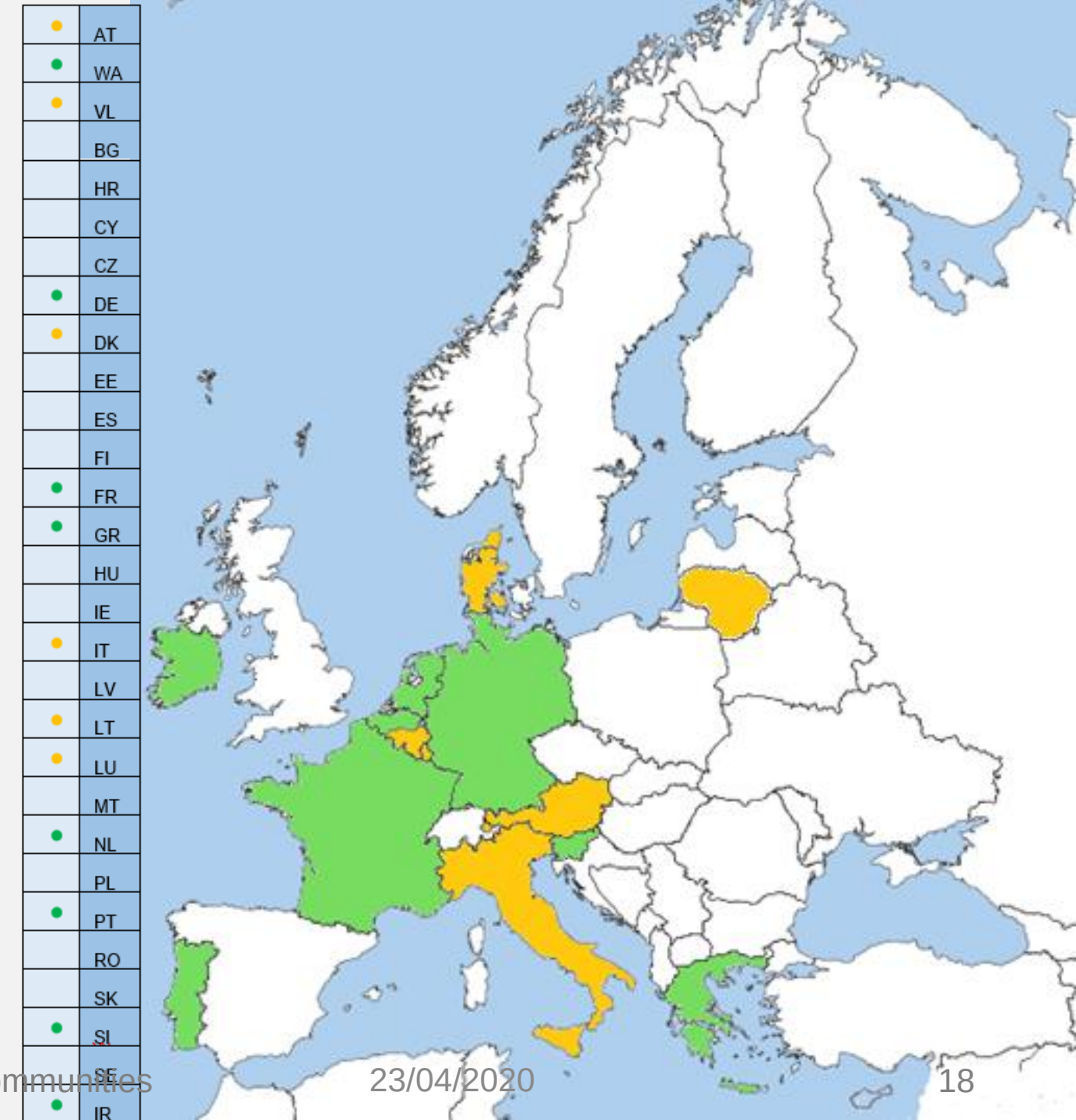
Participation!



- cooperating with experts at www.smartgridsplus.eu
- reading and commenting Living Documents
- taking part in online discussions

Countries Investigated for Intermediate Report

- Intermediate results
  - countries with existing framework
  - countries with emerging framework
  - countries implementing RECs / CECs
- Outlook
  - expand target group: government officials, regulators
  - new methodology: semi-structured interviews



Active support for CEC/REC

- clear legal framework
- financial support for setup
- financial support for operating
- capacity building for key actors
- capacity in terms of time
- counselling with models / templates
- network for knowledge exchange
- umbrella to reduce risks, costs etc.
- electrical technology
- software for operating the community
- clear positioning of DSO / TSO

No	Name	
class 1	Collective generation and trading of electricity	al on Pla
class 2	Generation-Consumption Communities	cert - not
class 3	Collective residential self-consumption	gener ings; in
class 4	Energy positive districts	districts systems (
class 5	Energy islands	real island standalone gyNet)
class 6	Municipal utilities[2]	existing orga citizens' conti controlled by
class 7	Financial aggregation and investment	a "community" ment in generat
class 8	Cooperative Financing of Energy Efficiency	citizens jointly in bly in their own re
class 9	Collective service providers	all types of commer charging stations, ag
Class 10	Digital energy supply and demand response systems	all types of digitally c chain), these days pos

Support Needs – assessed for …	The Netherlands
clear legal framework	5
financial support for setup	0
financial support for operating	0
capacity building for key actors	1
capacity in terms of time	1
counselling with models / templates	3
network for knowledge exchange	4
umbrella to reduce risks, costs etc.	3
electrical technology	0
software for operating the community	5
clear positioning of DSO / TSO	5

Recommendations

1. Draw on the experiences of existing energy community initiatives, or create a temporary space for them to emerge in
2. Dare to be ambitious to maximize the potential of energy communities, but adequately differentiate between types
3. Specify principles of 'autonomy', 'effective control' in order to avoid elite-capture
4. Define the concept of 'locality' for collective self-consumption and energy sharing in line with grid topology, but do not equate it with the element of 'proximity' for REC
5. Put in place participation mechanisms for energy poor and vulnerable households
6. Consider the value that CEC and REC can provide to the public network
7. Consider the value of REC and CEC to the community
8. Pro-actively support the set-up of REC and CEC
9. Consider a separate auction-based support scheme for REC
10. Streamline, simplify and make less burdensome licensing and network connection procedures
11. Do not reduce the concept of CEC and REC to mere collective self-consumption and vice versa

Class	*Name*	*Example presented at MIA Online*
1	Collective generation and trading of electricity	**Collective generation and trading in the Netherlands** Job Swens, J-OB
2	Generation-Consumption Communities	**Experiences with collective self-consumption in France** Alexandra Battle, TECSOL
3	Collective residential & industrial self-consumption	**Housing associations as energy communities: FlexShape in Denmark** Prof. Torben Bach Pedersen, Aalborg University
4	Energy positive districts	**Energy positive districts as nucleus for energy communities** Andreas Tuerk, JR
5	Energy islands	**About islands and other autonomous communities in Greece** Takis Ktenidis, TILOS project
6	Municipal utilities	**Local utility operating on behalf of and supporting the citizens** Gerhard Meindl, Stadtwerke Wunsiedel, Germany
7	Financial aggregation and investment	**Financial Aggregation and Investment** **Josh Roberts,** REScoop
8	Cooperative Financing of Energy Efficiency	**Local organizations for fostering energy efficiency: ALLIES in Hungary** Gergely Toth, KÖVET, Hungary
9	Collective service providers	**Jointly providing flexibility and grid services while charging EVs** Tereza Borges, Lumenaza, Germany / UK
10	Digital supply and demand response systems	**Digital Energy supply and demand response systems** Natalie Samovich, ENERCOUTIM

The Examples

1. **Collective generation and trading in the Netherlands**
   Job Swens, J-OB
2. **Experiences with collective self-consumption in France**
   Alexandra Battle, TECSOL
3. **Housing associations as energy communities: FlexShape in Denmark**
   Prof. Torben Bach Pedersen, Aalborg University
4. **Energy positive districts as nucleus for energy communities**
   Andreas Tuerk, JR
5. **About islands and other autonomous communities in Greece**
   Takis Ktenidis, TILOS project
6. **Local utility operating on behalf of and supporting the citizens**
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8. **Local organizations for fostering energy efficiency: ALLIES in Hungary**
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9. **Jointly providing flexibility and grid services while charging EVs**
   Tereza Borges, Lumenaza, Germany / UK
10. **Digital Energy supply and demand response systems**
    Natalie Samovich, ENERCOUTIM

1

Collective generation and trading in the Netherlands

Job Swens, J-OB

Collective generation and trading in the Netherlands

Job Swens
Job.swens@J-OB.nl
job@spectral.energy
+31 6 11 309 603

Schoonschip (Clean-ship) – plan 2008

powered by Spectral

BEELD: SPACE&MATTER

Schoonschip (Clean-ship) – march 2019

powered by Spectral

What did Schoonschip want

- Collective (aggregated) generation ánd storage
- Collective / mutual internal trading
- Collective / aggregated external trading:
  - APX,
  - FCR (Frequency Containment Reserves),
  - etc.

But also: (Energy Communities 2, 9, 10)

- Experiences with collective self-consumption (EC2)
- Jointly providing flexibility and grid services while charging EVs (EC9)
- Digital Energy supply and demand response systems (EC10)

What did Schoonschip need

To locally balance demand and generation:

- Operation of the local grid,
- Metering of supply to and feed back from final consumers
- Management of demand response
- Coordination of generation
- Coordination of storage

Trade electricity on all electricity markets

- Have access to the grid
- Be regarded as a significant grid user (SGU)
- Be allowed to offer ancillary services

What did Schoonschip do

- Community of 46 households on 30 ships
  (14 single; 16 double)
- 46 private PV systems
- 46 separate real estate objects
- 30 community owned batteries (one per ship)
- 1 community owned real estate object
  (a.o. the jetty, smart grid, battery network)
- 1 grid connection
- 1 community owned micro grid.
- Centralised energy management (future: blockchain?)

Legal obstructions

Schoonschip was not allowed to:

- operate a (local) micro grid for households
- provide connections to the grid
- transport Electricity over the grid
- meter electricity production from RE sources
- provide, maintain and operate metering equipment for small consumers (art. 95a: connection ≤ 3*80A)) with
- supply electricity to small consumers (≤ 3*80A) without an energy supply licence (a.o. programme responsibility)

The Solution

Regulatory sandbox: “Experiments Electricity Law”:

Allowed to:

- Own and/or operate a local grid
- To provide maintain and operate metering equipment
- Trade electricity on all electricity markets (including ancillary grid service markets

NB: max 10 per year; limited duration (10 year)

Provisions EU, NL and EU-cep

	EU - old	NL - now	EU-CEP
Balancing			
Operation of a local grid	X	X	√
Metering of supply and feed-in	O	X	√
Management of demand response	O	X	√
Dispatch of generation	O	√	√
Management of storage	√	√	√
Supply to households	X	X	√
Trading on energy markets			
Access to the grid	√	√	√
Access to commercial markets	√	√	√
Trade on ancillary markets	0	0	√

Two other examples:

1. Aardehuizen, Rietgors, Olst

- 100% selfsufficient
- Exchange of electricity
- Autonomous price setting
- Internal energy management
- Autonomous grid operation
- DSO grid ownership

Two other examples:

2. Collegepark Zwijsen, Burgemeester de Kuijperlaan 10, Veghel

- Joint ownership of PV solar system
- Joint ownership of internal grid
- Internal energy management
- Joint trading on electricity markets

NB: running legal discussion between project and tax authorities

For further information

SchoonSchip:
https://schoonschipamsterdam.org/#site_header
https://spectral.energy/projects/ (scroll down)

Aardehuizen:
https://www.aardehuis.nl/nl/

Collegepark Zwijsen:
http://www.collegeparkzwijsen.nl

Job Swens
Job.swens@J-OB.nl
job@spectral.energy
+31 6 11 309 603

2

Experiences with collective self-consumption in France

Alexandra Battle, TECSOL

Mission Innovation Austria
Energy Communities session

Collective self-consumption (CSC)
in France

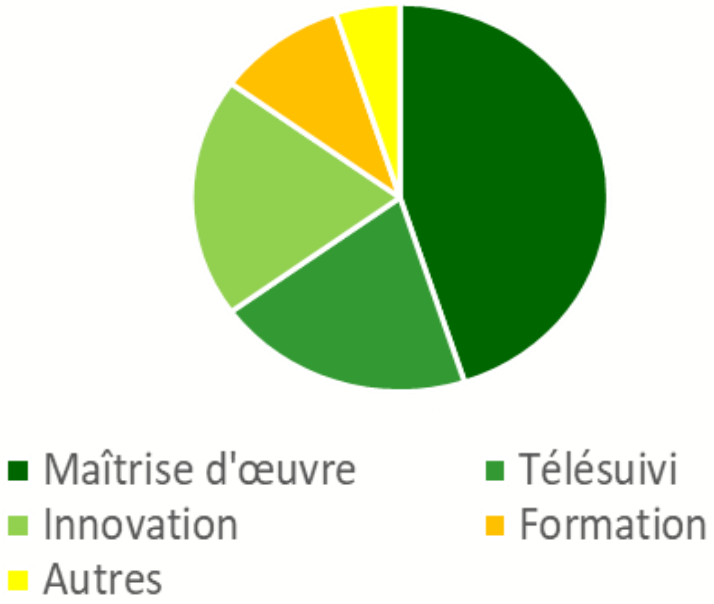
23/04/2020

alexandra.batlle@tecsol.fr

TECSOL

- Bureau d'études **indépendant**
- **35 ans** d'expérience
- Une **quarantaine** d'ingénieurs
- Une clientèle composée de **maîtres d'ouvrage publics et privés**
- Des projets **thermiques et photovoltaïques**
- Activité Maîtrise d'œuvre certifiée **ISO 9001 et 14001**
- **En France et à l'export**
- Spin-off : **Sunchain**

Segmentation des activités de Tecsol (% du CA)

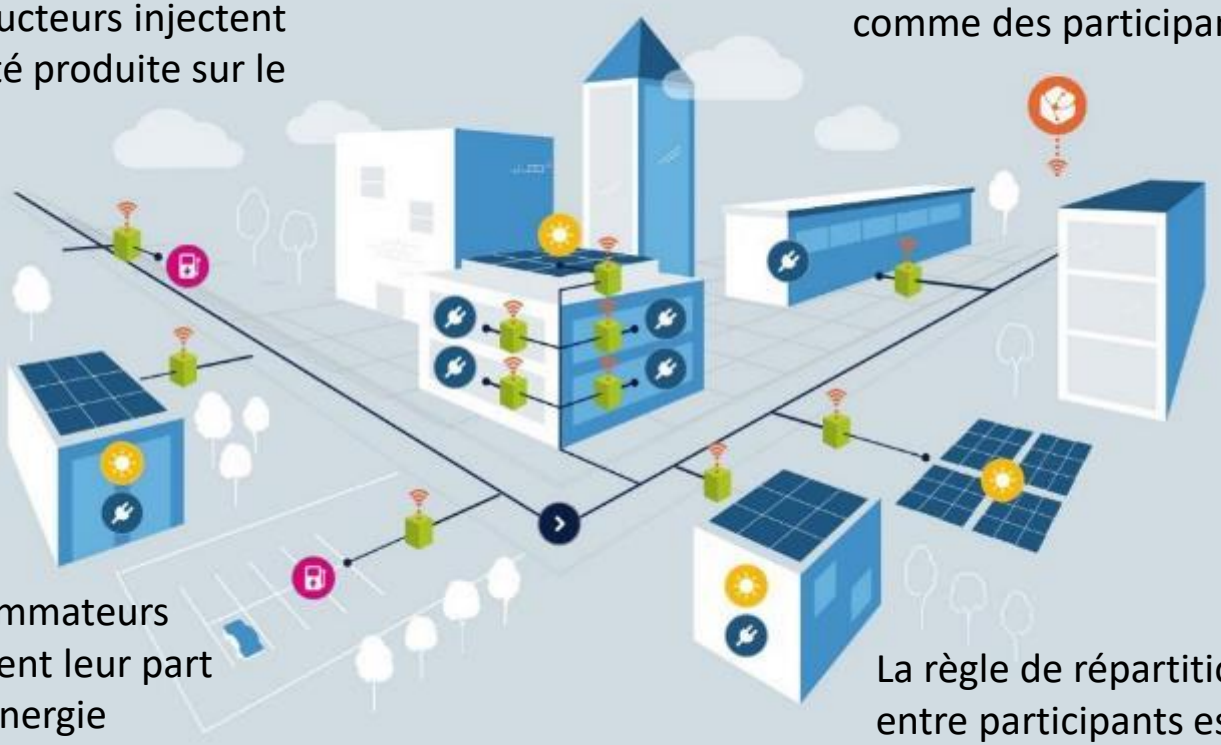


Quelques références clients

French CSC concept

Les producteurs / autoproducteurs injectent l'électricité produite sur le réseau

Les véhicules électriques et batteries peuvent être vus comme des participants

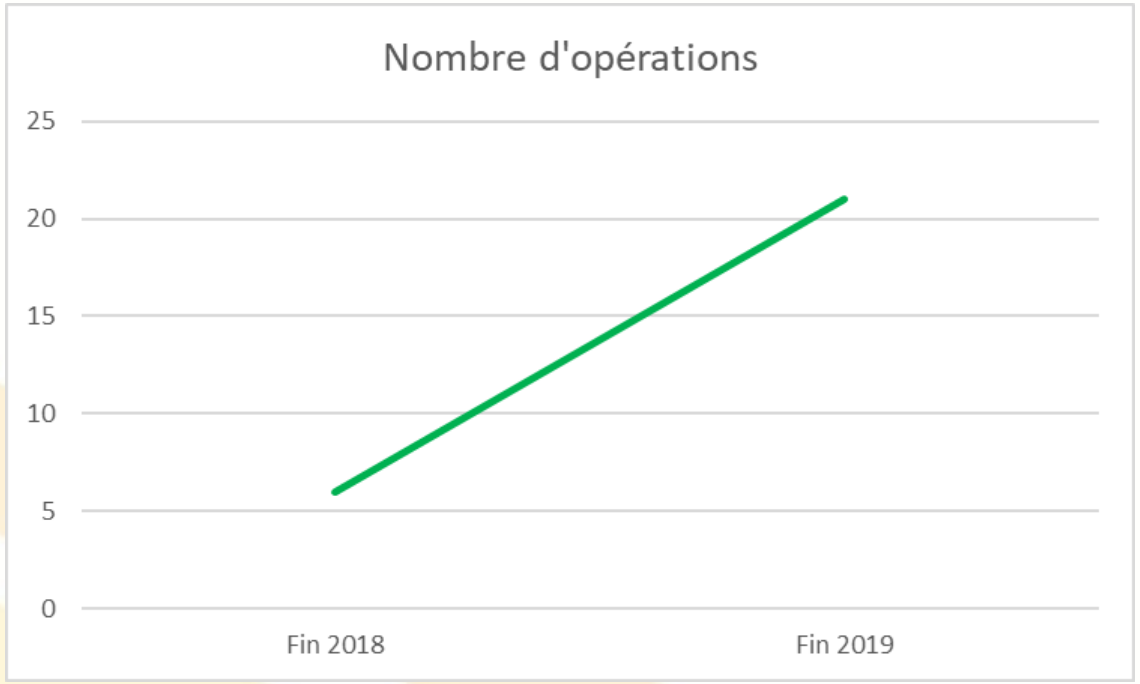


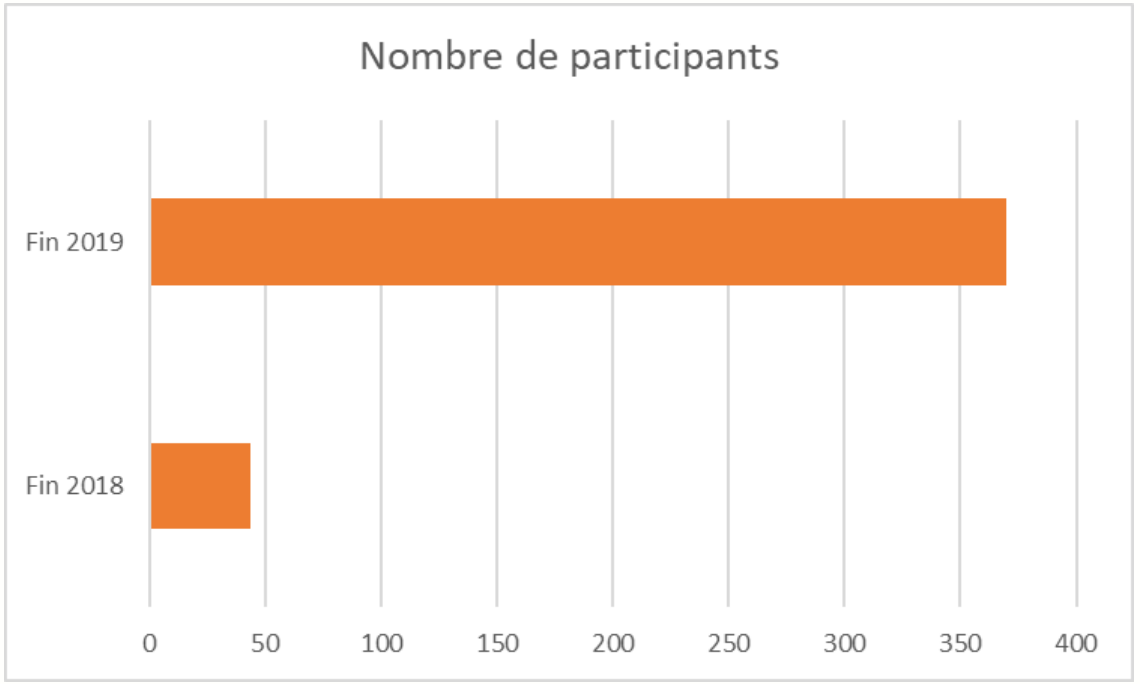
Les consommateurs consomment leur part de cette énergie

La règle de répartition des flux entre participants est transmise par une personne morale organisatrice au GRD*

*Gestionnaire du Réseau public de Distribution d'électricité. Enedis pour 95% du territoire national

CSC in France : facts & figures





Source : ENEDIS

<u>À fin mars 2020</u> :

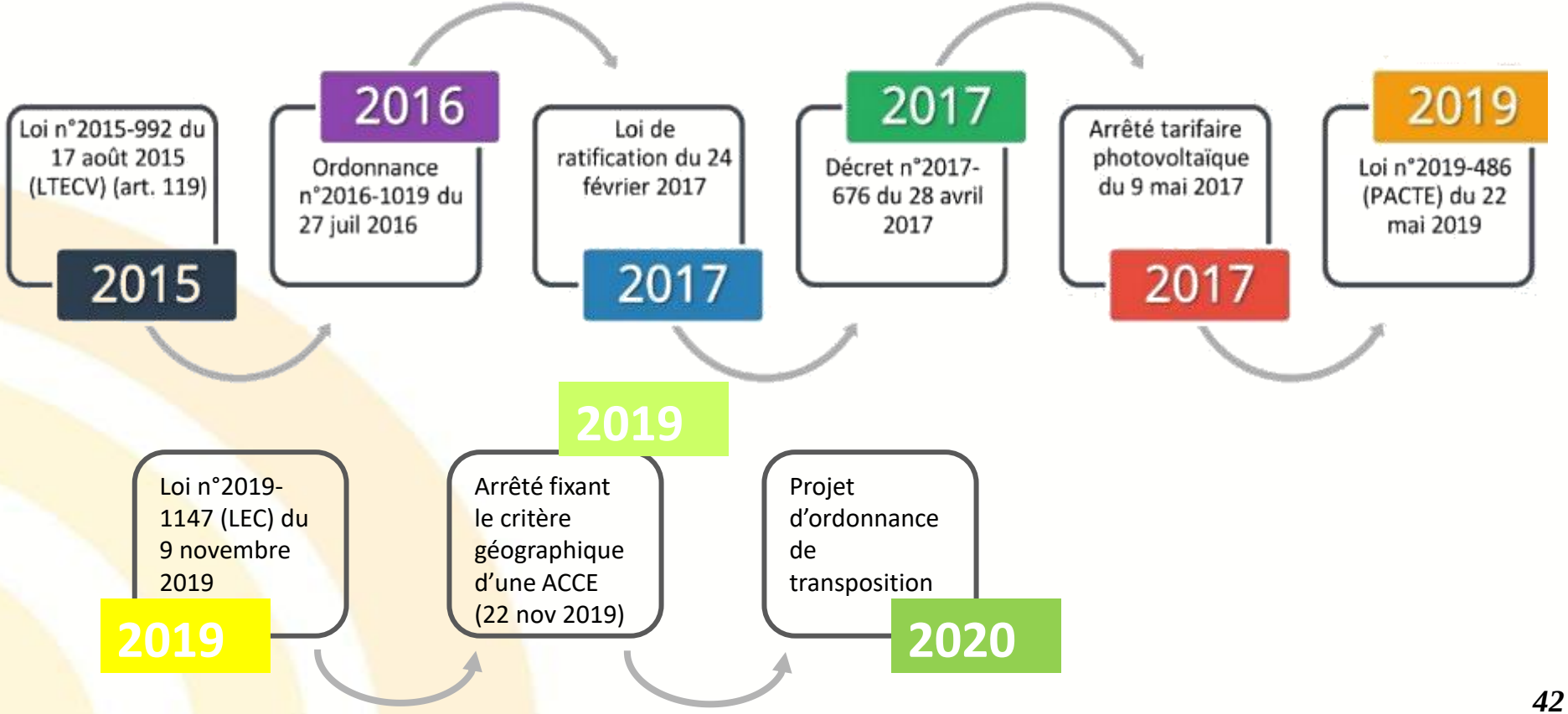
30 *opérations d'autoconsommation collective en service*

500 *participants*

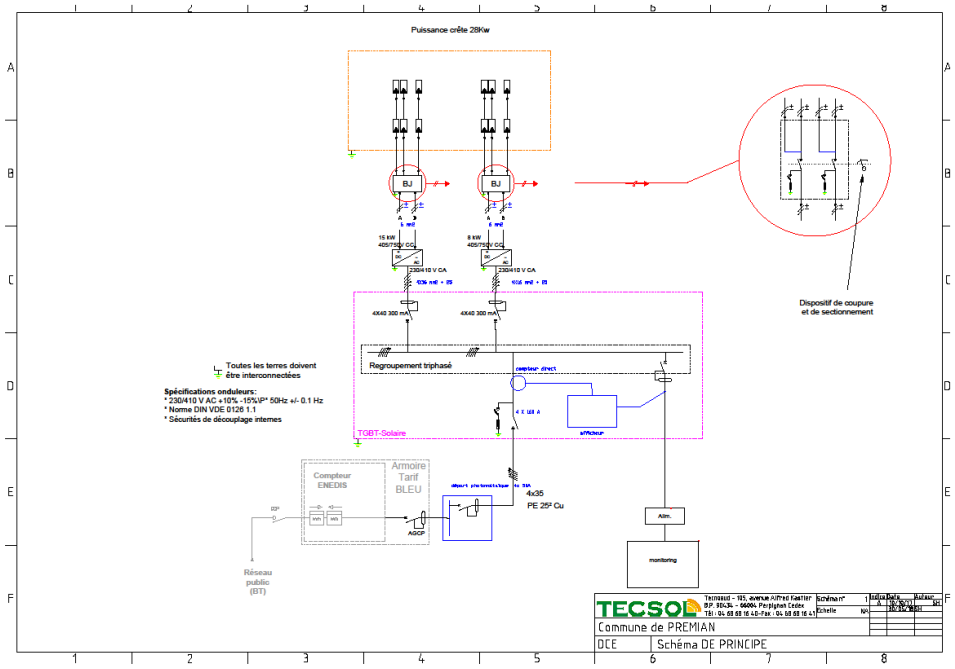
The legislative and regulatory framework

Article L. 315-2 du Code de l'Energie

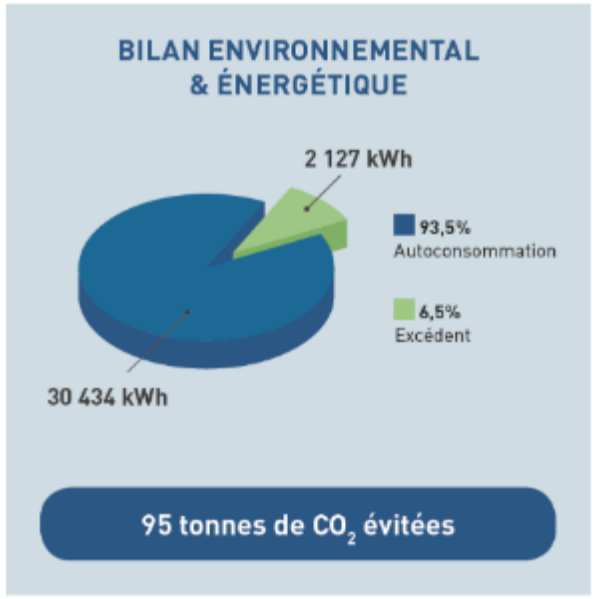
*L'opération d'autoconsommation est **collective** lorsque la fourniture d'électricité est effectuée entre **un ou plusieurs producteurs** et **un ou plusieurs consommateurs (…)***



Use Case #1 : Prémian (34) - village



PMO : « Prémian Energie Positive » association



CAPEX : 52 000 €

- **28 kWp on the roof of the municipal atelier**
- **Shops, residents, public buildings…**

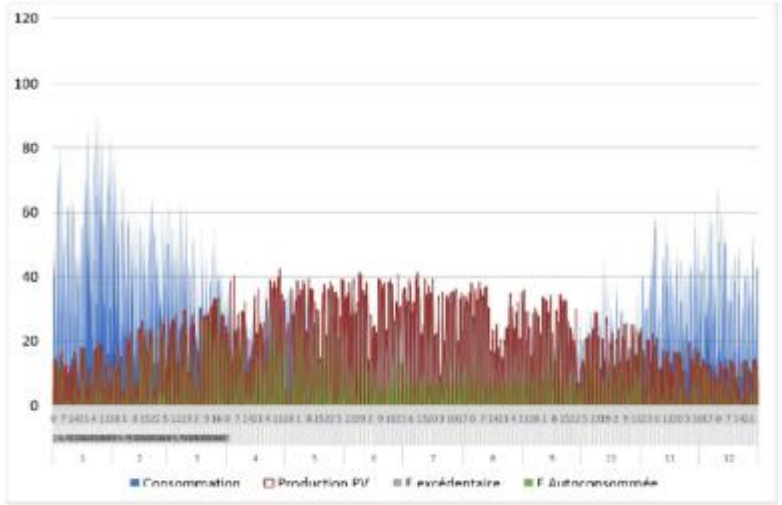
Use Case #2 : Onet (12) - social housing

Sociological study ongoing in the framework of the DIGISOL project

9 kWp (+20 kWp in individual SC)
In use since 07/2019

20 tenants
1 common parts

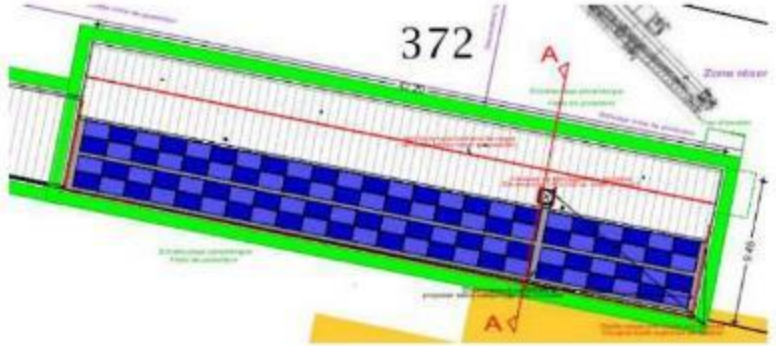
- Payback time : about 12 years
- CAPEX : 51 500 €
- Annual savings : 4 521 €



Courbes d'énergie annuelles (kW)

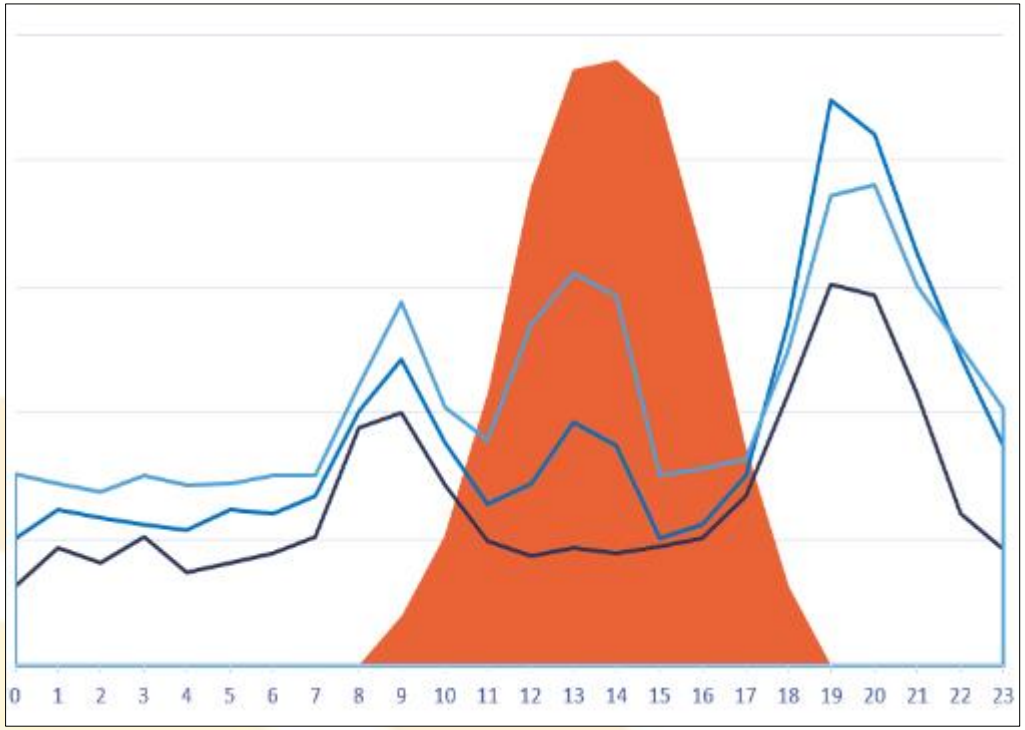
89,3 % Self-consumption

10,7 % Surplus



Principe de toiture

Sharing electricity in CSC : a key issue



Les faits :

C1 a consommé l'équivalent de 50% de la prod

C2 en a consommé 30%

C3 en a consommé 20%

Si on avait fixé la règle statique

33% pour C1 -> distribution de 33% de la prod

33% pour C2 -> distribution de 30%

33% pour C3 -> distribution de 20%

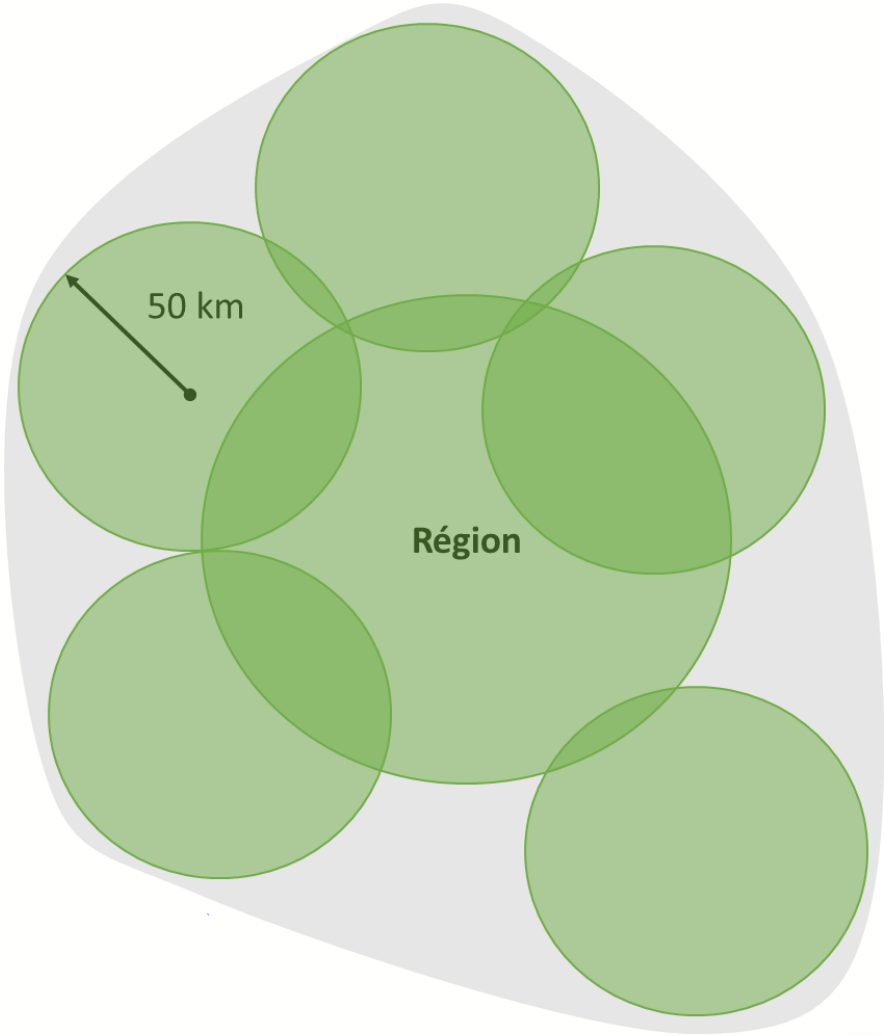
-> 17% non valorisé

=> Répartition dynamique

SUNCHAIN

TECSOL

Towards Energy Communities…



3

Housing associations as energy communities: FlexShape in Denmark

Prof. Torben Bach Pedersen, Aalborg University

Housing Associations as Energy Communities: FlexShape in Denmark

Prof. Dr. Torben Bach Pedersen

Aalborg University and FlexShape

www.flexshape.dk

Who and Where?

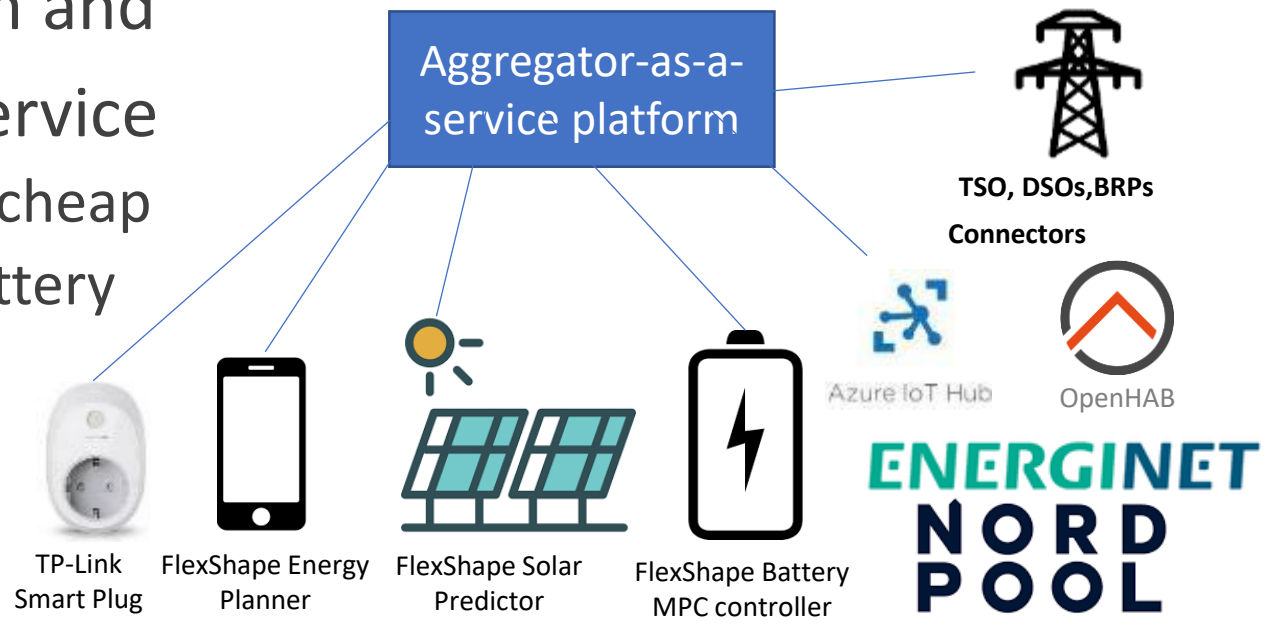
- In Denmark
  - Very **high electricity taxes** (wholesale **<0.04€/kwh**, consumer**>0.3€/kwh**)
  - Very **attractive business case** for **self-consumption**
  - Many non-profit **housing communities** renting flats to **tenants**
  - A (part of a) housing community can become a **self-led** energy community
- Where: Aarhus, Denmark
- Who:
  - DanSolar: PV turnkey solutions **and** electricity supplier
  - VisBlue: Down-scaled vanadium-flow batteries
  - FlexShape: ICT platform for energy communities – big and small

Purpose and activities

- Purpose
  - Turn a housing community into a self-sufficient renewable energy community
- Activities:
  - Housing community **signs contract** with DanSolar as electricity supplier
    - Single meter ”at the entrance”, all flats are ”behind the meter”
  - Dansolar **finances and installs PV+battery**, FlexShape **installs ICT system**
  - Housing community tenants use electricty - **with help and guidance**
  - FlexShape ICT platform **optimizes self-consumption**, **battery (de)charging**, electricity **procurement from grid**, providing **grid services from battery**
  - After 10 or 15 years, **PV+battery ownership transfers** to housing community

How Does It Work ?

- FlexShape Solar Predictors **predicts PV production**
- FlexShape Energy Planner **app predicts and optimizes loads** to increase self-consumption
- FlexShape Battery MPC Controller **plans battery (de-)charging** to maximize self-consumption and
- FlexShape Aggregator-as-a-Service
  - **Procures grid electricty** when cheap
  - **Provides grid services** with battery



Benefits, Business Model, Transfer

- Business model: 2 options
  - Tenants pay **same** price as before, ownership transfers after **10 years**
  - Tenants pay **20% less** than before, ownership transfers after **15 years**
  - DanSolar **finances installation**, **paid by no tax** on self-consumption
  - After ownership transfer, **>80% discount** on self-consumption
- Benefits
  - **No installation expenses** for housing community or tenants
  - Electricity **same price or cheaper** for tenants
  - **Higher savings and income** due to FlexShape ICT platform
- Transfer to other places
  - Technically straightforward, but business case depends on taxes (VAT++)

Status and Contacts

- Status
  - First installation expected fall 2020
  - Stay tuned for experiences
- DanSolar www.dansolar.dk
- VisBlue www.visblue.dk
- FlexShape www.flexshape.dk torben@flexshape.dk

The project Flexible Energy Production, Demand and Storage-based Virtual Power Plants for Electricity Markets and Resilient DSO Operation (FEVER) receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 864537.

4

Energy positive districts as nucleus for energy communities

Andreas Tuerk, Joanneum Reserach

Energy positive buildings/districts as nucleus for energy communities

Andreas Tuerk, Joanneum Research Graz

Mission Innovation online session

23.04.2020: Flavours of Energy Communities

New context for Plus Energy buildings/districts

- **Plus energy buildings economically not viable**
- New electricity market directive opens up **possible new revenue streams** via interacting with the grid/market
- *Optimizing the interplay of local generation, storage, consumption at the building and district level, capitalising on new ICT opportunities may unlock new revenue streams*

H2020 Project EXCESS: FleXible user-CEntric Energy poSitive houseS

EXCESS
LIVE IN POSITIVE ENERGY

EXCESS DEMO SITES

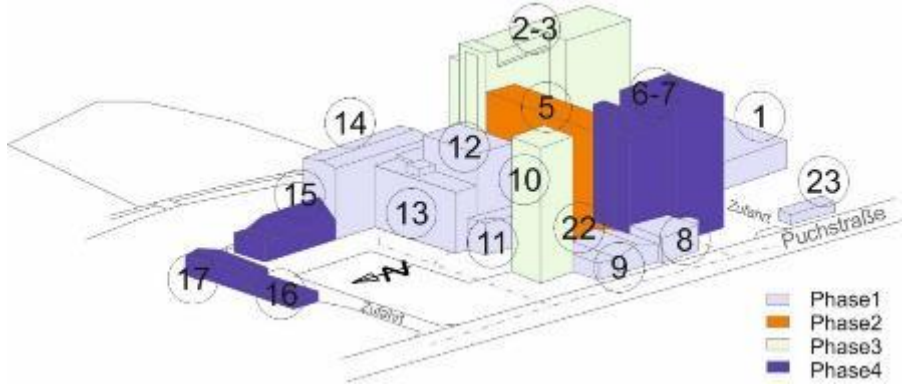
- Demo Site Hasselt, Belgium
- Demo Site Granada, Spain
- Demo Site Helsinki, Finland
- Demo Site Graz, Austria

- Hasselt Belgium: PVT, heatpumps, wind (VITO)
- Helsinki: PVT, deep borehole, heat pumps (VTT)
- Granada, Spain, PV, PVT, storage (CENER)
- Graz, Austria: PV facade, heatpumps, electricial and thermal storage (AEE INTEC)

Energy trading and flexibility services part of all the demos

Demo site Graz: overview

- Former industrial area for feed production in Graz, „Tagger area“ being turned into a modern commercial area. One feed silo will be turned into a PEB (hostel)
- Highly efficient renovation. Entire energy supply based to a large extent on locally produced RES (solar energy, groundwater; heat pumps, small hydropower)
- Existing thermal mass of one the buildings activated via a prefabricated multifunctional façade element (heating and cooling supply and façade integrated PV)
- Only one connection to the main grid



Demo site Graz: aims

- Reduce the stress factor of primary power grids by using different flexibilization elements
  - Maximum energy flexibility by integration of innovative elements for load shifting, storage, user integration, interaction with the local electricity grid as well as a smart control and dynamic loads
  - Cascading ground source heat pumps combined with heat-side elements (activated building mass, decentralized buffer storages).
  - Community battery (225kWh)
  - 5 eV controllable charging stations

Moving to an Energy Community

- Site owner possible operator of the community, organisational format not yet decided
- Possible societal and system benefits (high RES shares, reduced peaks)
- In principle high replicability potential but concept not yet transferable as
  - Economics are unclear
  - Building laws in all 9 Austrian federal states have different technical regulations, e.g. how dense a settlement can be
  - Lack of expertise with architects and designers

5

Islands and other autonomous communities in Greece

Takis Ktenidis, TILOS project

About islands and other autonomous communities in Greece

Takis Ktenidis
Senior researcher
SEALAB, UNIWA
TILOS project
Greece

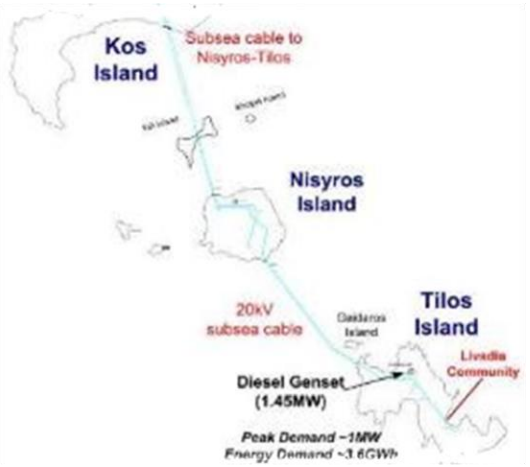
Despoina Boulogiorgou
Researcher

www.sealab.gr
www.tiloshorizon.eu

pktenidis@uniwa.gr

Flavours of Energy Communities
April 2020

1. Where is it? and who leads the initiative



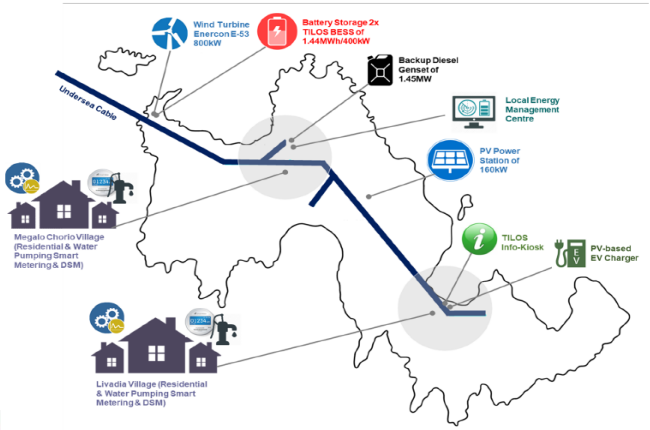
- TILOS is in South East Greece island complex of Aegean sea.
- The municipality of TILOS island is leading the initiative with strong support by Soft Energy & Environmental Protection Lab (SEALAB).

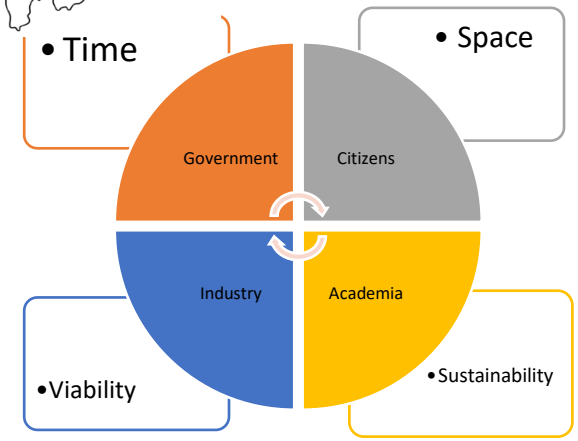
2. What is the purpose of the initiative and what are its activities?

- Manage to be self-sufficient, autonomous & produce energy for vulnerable households.
- Invest in RES (solar, wind, biomass etc)
- Transition to electric mobility (small vans, scooters, bikes)
- Use RES desalination for water production.

3. How is it organized (company? cooperative? association?) and who controls the community?

- Municipality manage/cooperative type
- Citizens~100 have already smart meters
- Experts-lab team-consult, present scenarios/solutions
- Quadruple helix approach





4. Who benefits (members, society) and how?

- Benefit the most vulnerable households
- Benefit the lower income
- Support municipality activities

- Secure kWh per year
- Water from desalination system base on RES

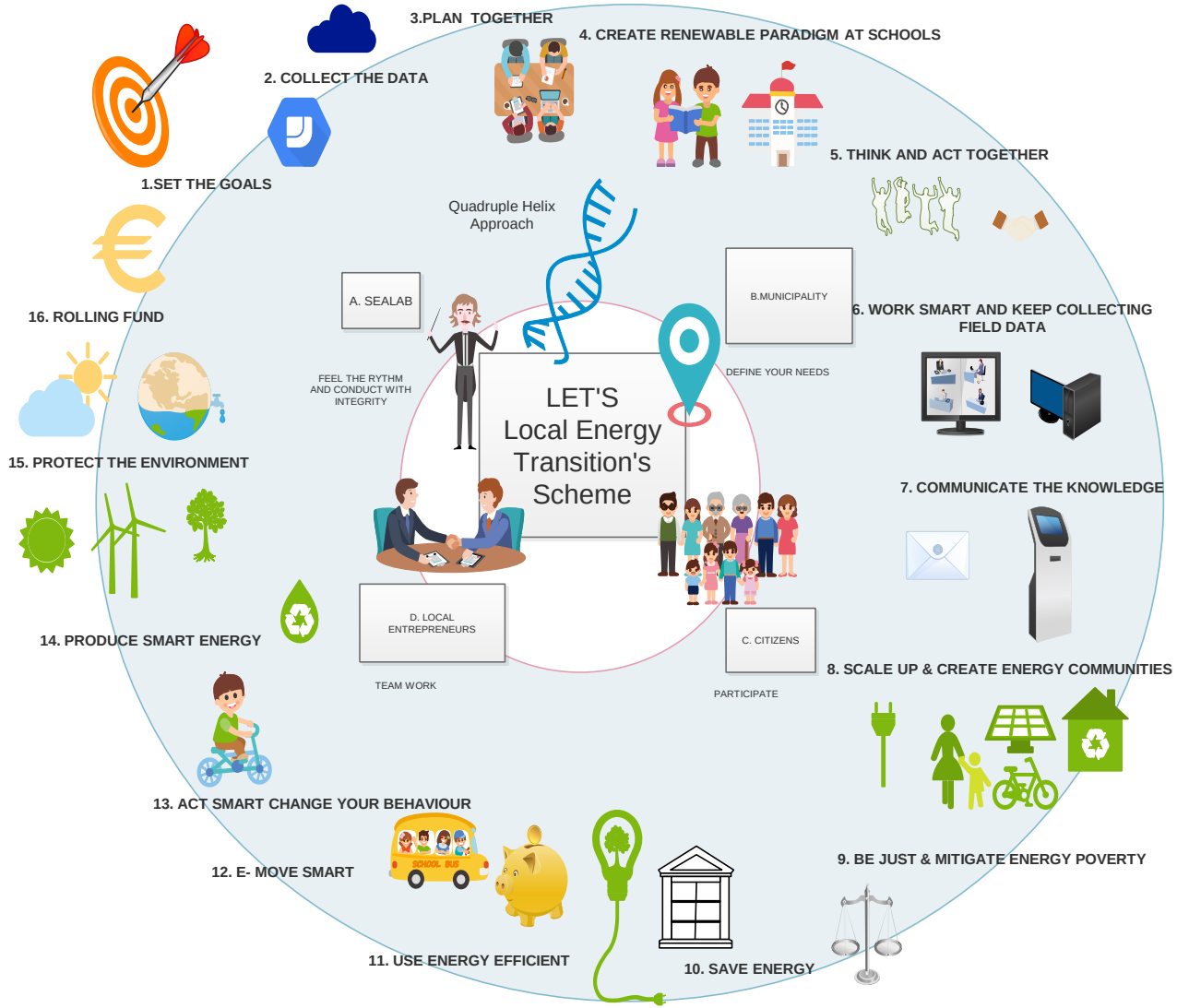
5. How could it be transferred to other regions and towns?

- Replicate in other islands
- Greek law supports non-profit, municipality driven energy communities
- Set local virtual (or physical) smart grids supporting members of the Energy Community or giving benefits to vulnerable even if there are not members.
- Mountain or practically isolated communities they can exploit locally RES availability like wind solar, bio.

6. What should we do? Replication Mechanism

Energy Citizenship through school field and local community engagement to produce and manage energy leading to environmental protection

Energy Civilizations



6

Utility operating on behalf of and supporting citizens
Gerhard Meindl, Stadtwerke Wunsiedel, Germany

SWW wunsiedel
wir bewegen

SWW WUNDSIEDEL GMBH

MIA April 23, 2020

Gerhard Meindl

Local utility operating on behalf of and supporting the citizens

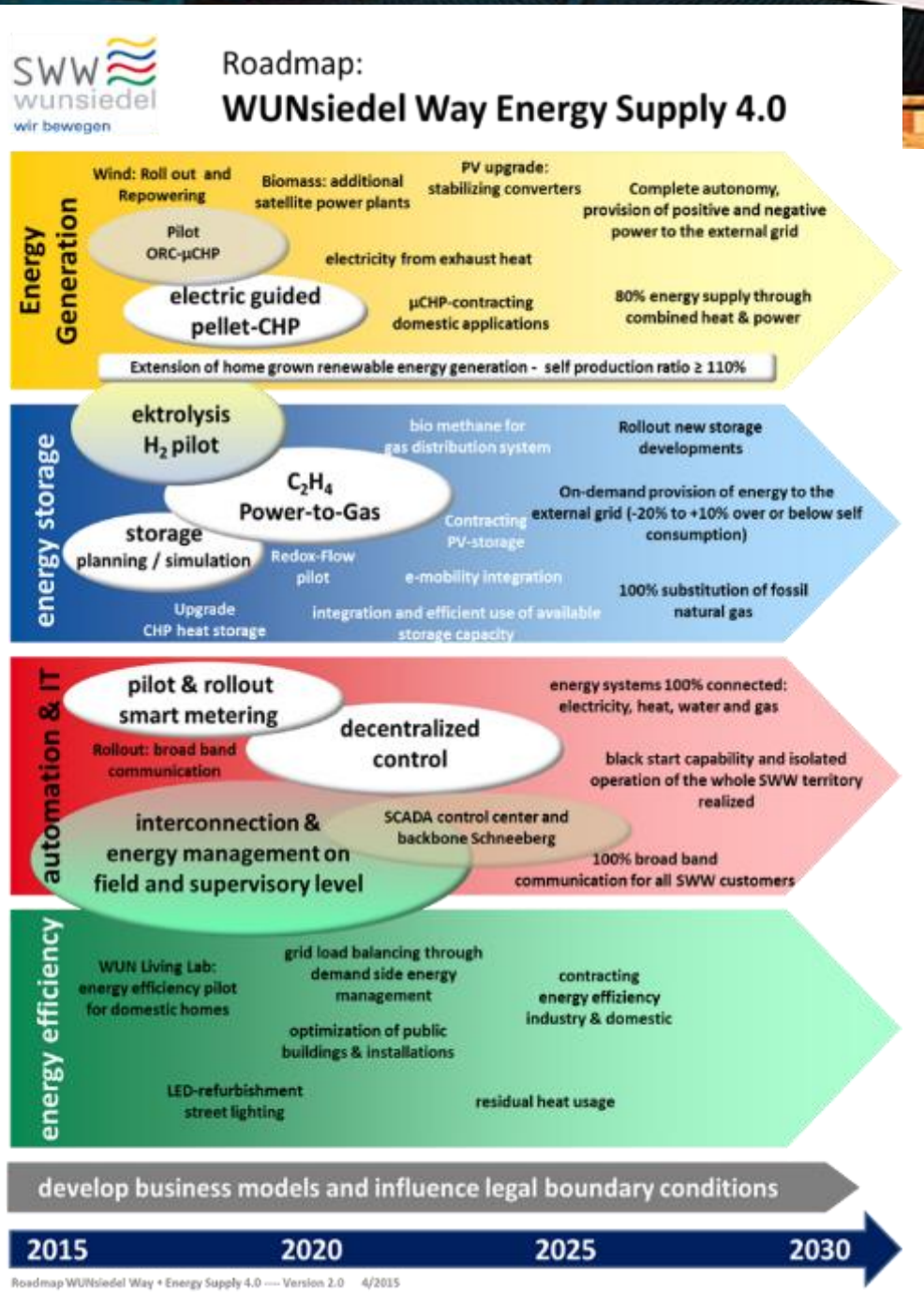
GAS VERSORGUNG WUNSIEDEL
solarpark
WUN elektro.
WUN solar.
WUN bioenergie.
WUN pellets.
ZEF Zukunft & Energie

SWW – Geopraphical location & short profile

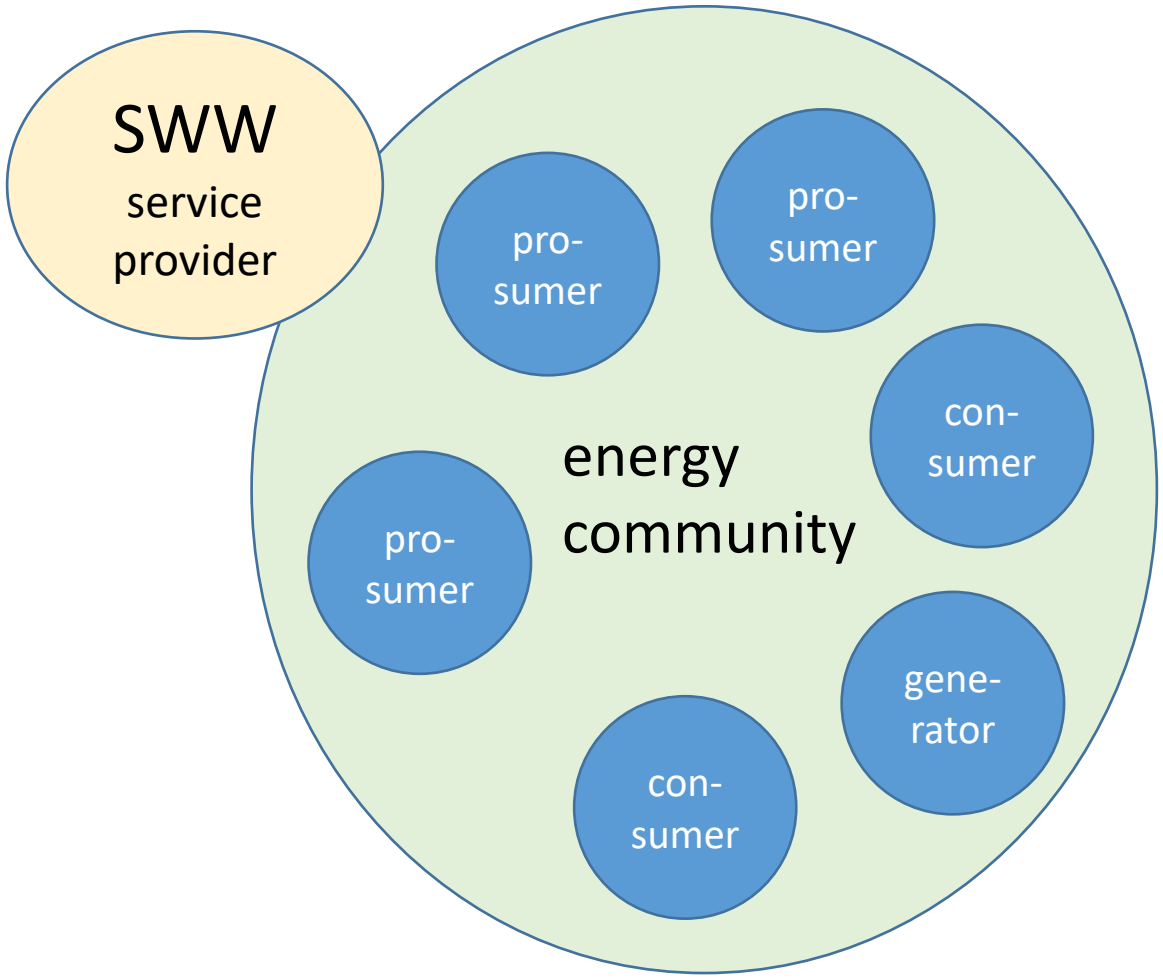
- DSO, highly innovative supply of energy, heat, water and gas
- focusing on the consistent production, use and expansion of renewable energy and sustainable technologies
- high RES distribution
  (e.g ~1.000 PV sites of all sizes, several wind parks, ~100 heat pumps, battery systems, hydrogen applications planned and EV charging stations)
- consumer/prosumer population covers all types of infrastructures
  (e.g. industries, SME, professional RES sites, farms, multifamily residences with common installations and single homes)

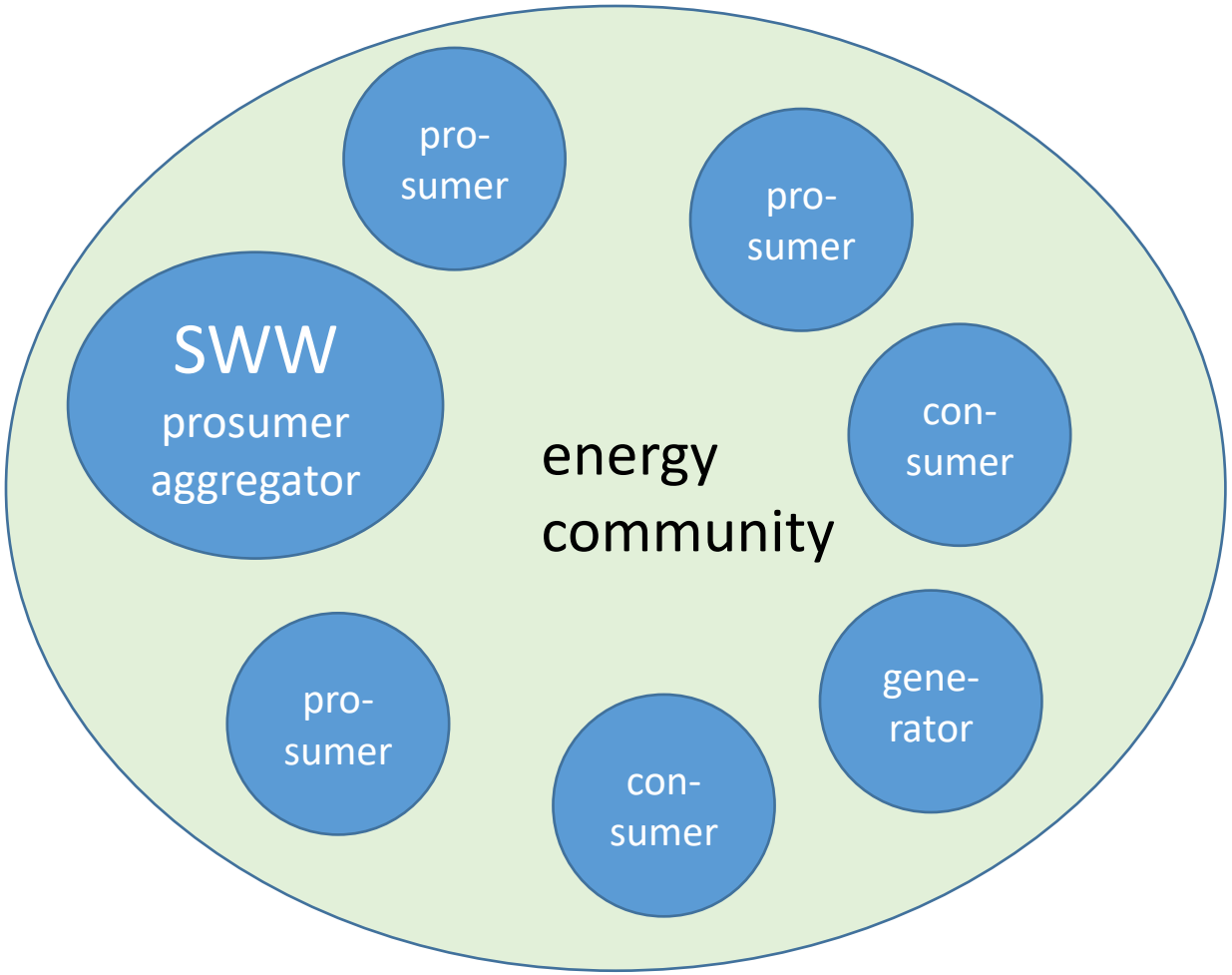
SWW – Energy community

- Realize Energy community as part of H2020 projects FEVER and EdgeFLEX
- Wunsiedel as trial site for various Use Cases
- Purpose:
  - Consumer and prosumer involvement in the energy transition
  - Maximize self consumption / self supply
  - Grid and energy balancing on low voltage level

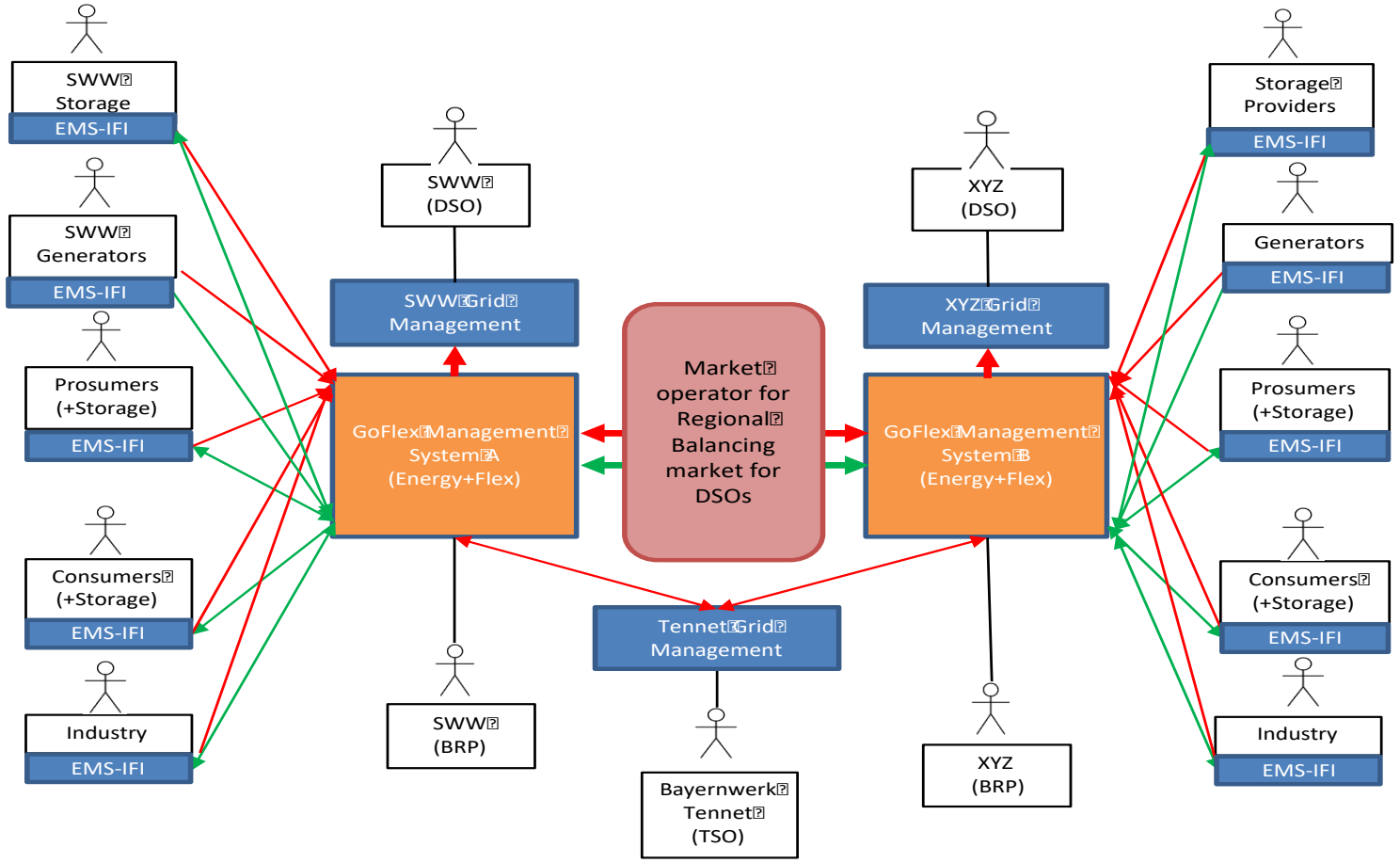


SWW – peer in a p2p trading model?





SWW –market operator for the community



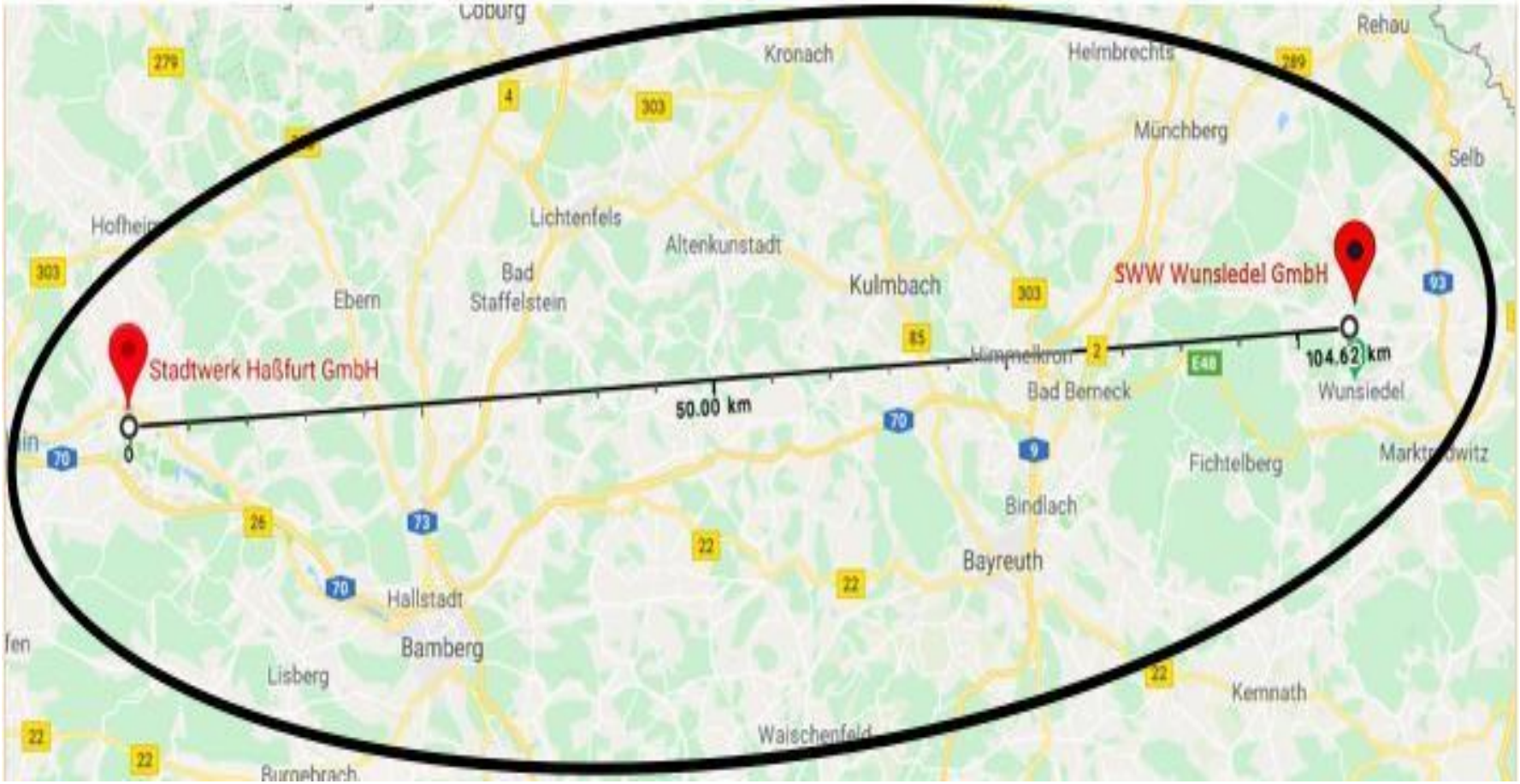
Regional Balancing Market for en.flex for DSOs, Cellular Exchange/Model

FLEXOFFER
flexoffer-community.eu

Idea from Goflex project

Trial site in FEVER project

FEVER


Coburg
Kronach
Helmbrechts
Rehau
Münchberg
Selb
Lichtenfels
Altenkunstadt
Bad Staffelstein
Ebern
Kulmbach
SWW Wunsiedel GmbH
Stadtwerk Haßfurt GmbH
50.00 km
104.62 km
Bad Berneck
Wunsiedel
Fichtelberg
Bindlach
Bayreuth
Hallstadt
Bamberg
Lisberg
Kemnath
Waischenfeld

7

Financial Aggregation and Investment

Josh Roberts, REScoop

The story of Ecopower

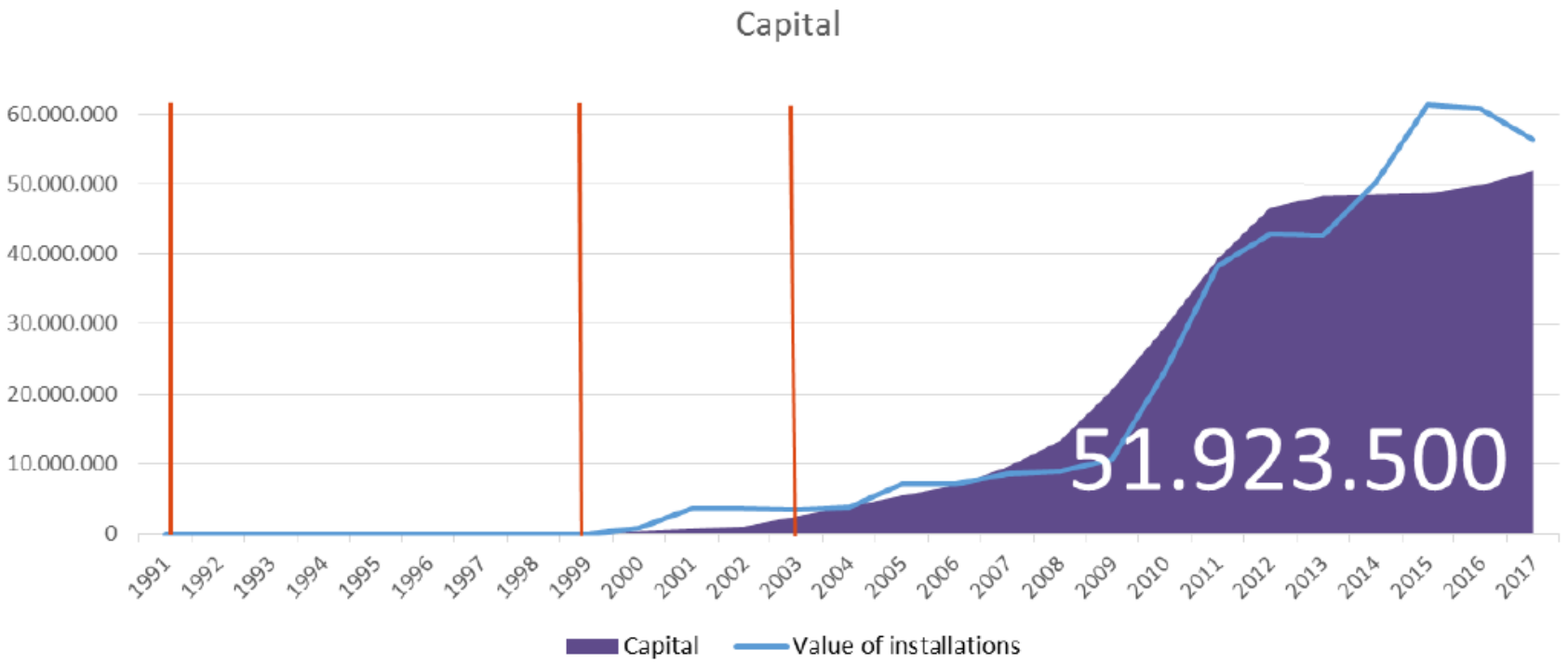
IEA-EGRD – Energy Communities

by Josh Roberts, Advocacy Officer, REScoop.eu
23 April 2020

Ecopower – the beginning

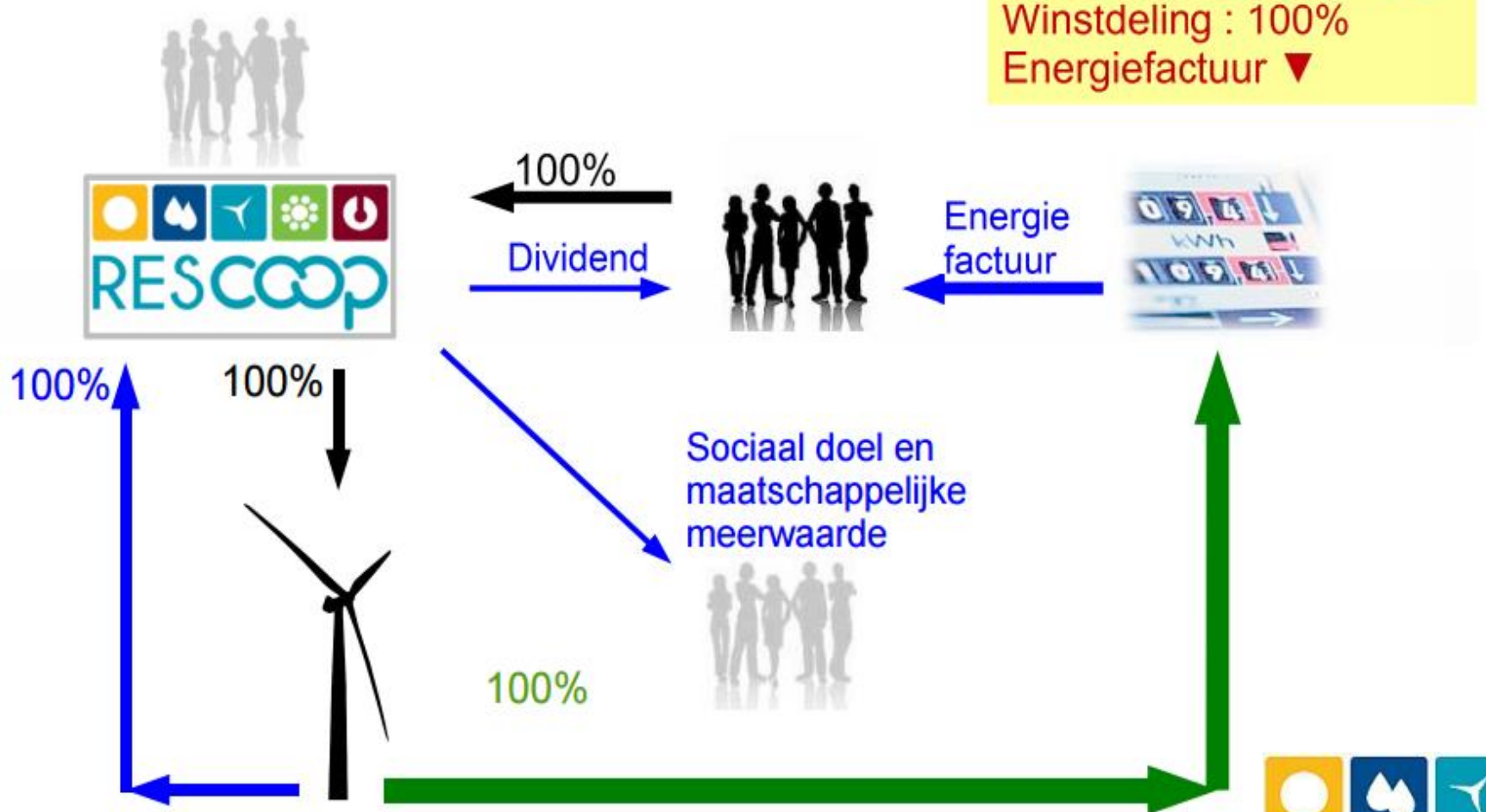
An evolution

- 1991 - founded | 1999 - restart | 2003 - supply electricity

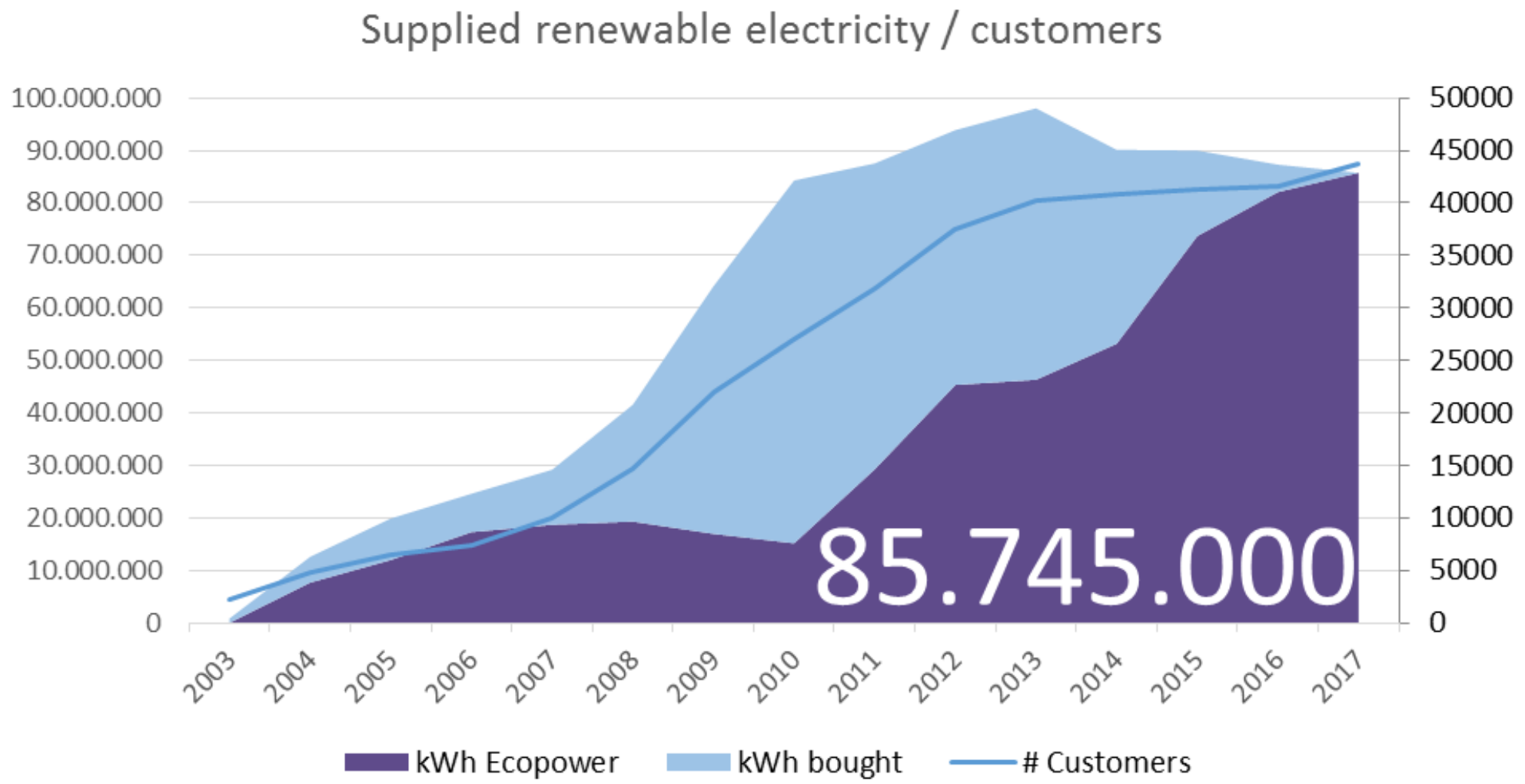


RECHTstreeks participatiemodel

Energie in eigen handen
Winstdeling : 100%
Energiefactuur ▼



RESCOOP.EU


Supplied renewable electricity / customers
100.000.000
90.000.000
80.000.000
70.000.000
60.000.000
50.000.000
40.000.000
30.000.000
20.000.000
10.000.000
0
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
85.745.000
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
kWh Ecopower
kWh bought
Customers

Planning towards the future…

- WiseGRID
  - District oriented
  - Batteries
  - Electrical vehicels

If you want to know more, please contact us!

Josh Roberts
Advocacy Officer
josh.roberts@rescoop.eu
@REScoopEU

8

Local organizations for fostering energy efficiency: ALLIES in Hungary

Gergely Toth, KÖVET

ALLIES

Activating and Learning from
Local Investments in Energy Savings

HETES

Helyi Energiatakarékossági
Együttműködések Segítése

Project partners:

B.A.U.M.

B.A.U.M.

fenntartható gazdálkodás
követ

INEM
International Network for Environmental Management

Sponsor:

Supported by:

Federal Ministry for the
Environment, Nature Conservation,
Building and Nuclear Safety

based on a decision of the German Bundestag

European
Climate Initiativ
EUKI

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

EUKI Allies HETES project

Aim:

Financial mechanism for supporting environmental savings and measures locally

Location:

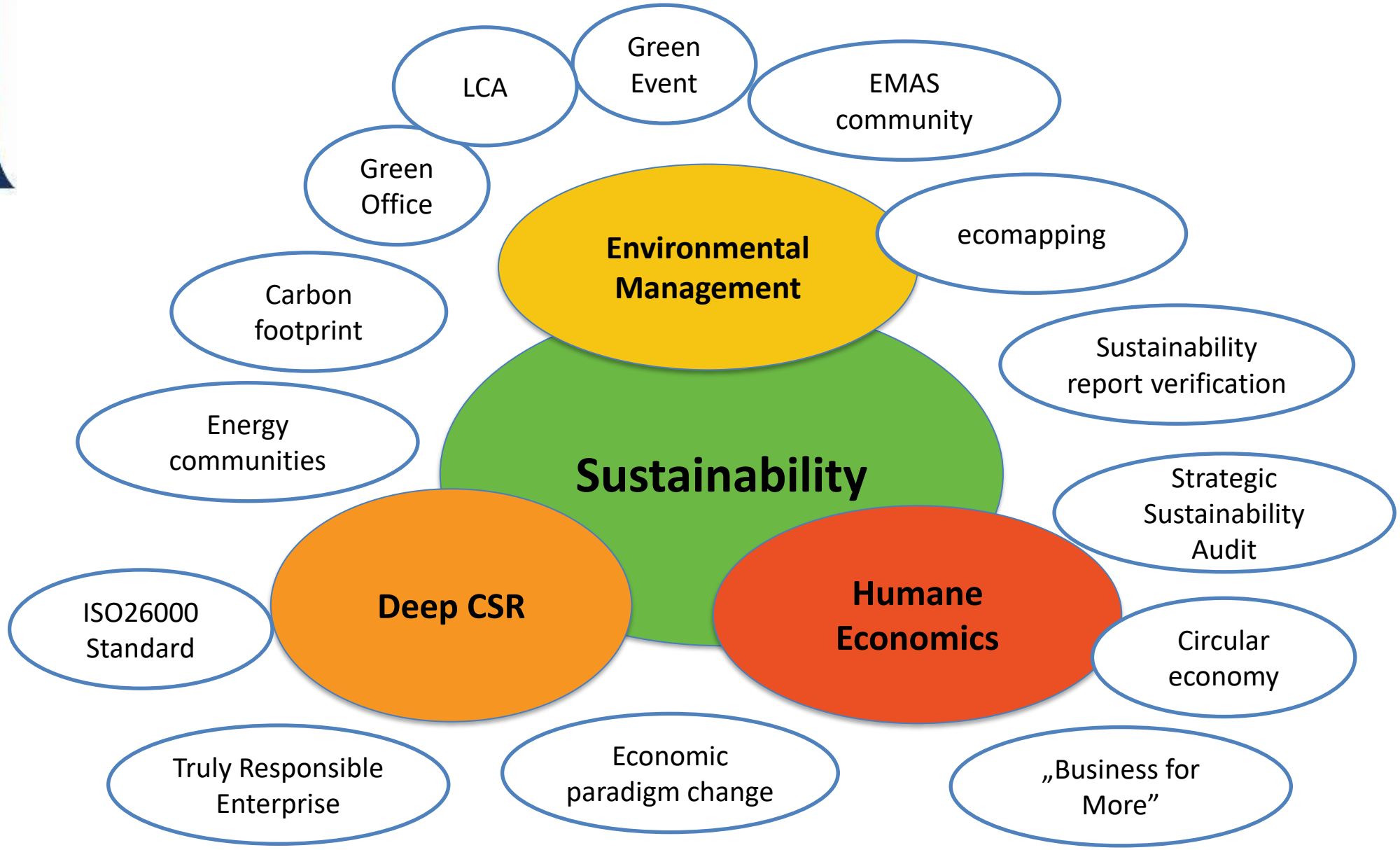
Zala and Somogy counties

Implementers:

KÖVET Association for Sustainable Economies

Lokalizáció Ltd. (owned by KÖVET and MagNet Community Bank)

KÖVET Association for Sustainable Economies



MagNet Hungarian Community Bank

The single community bank in Hungary

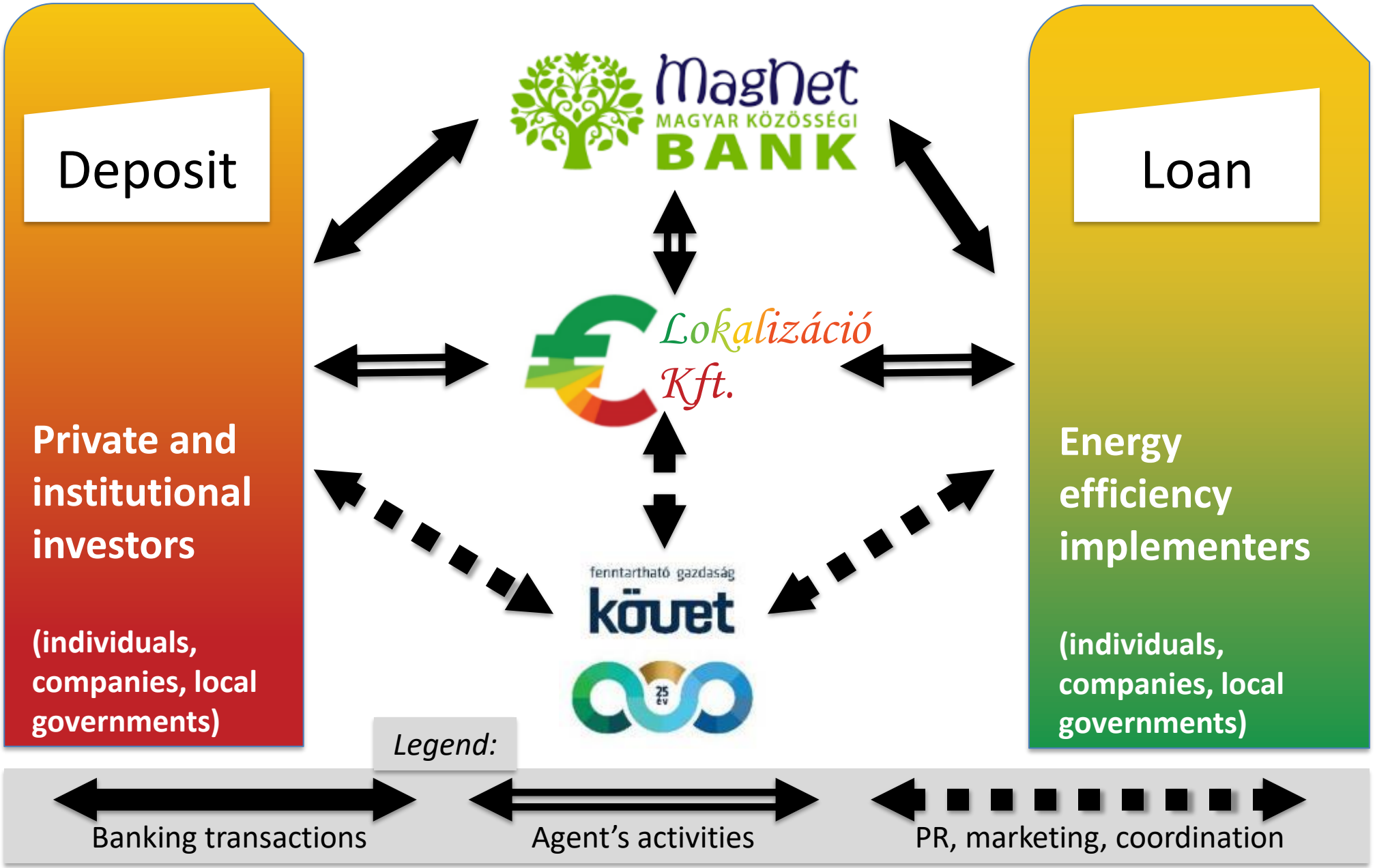
Existing solution for community deposit and loans

KÖVET member

Principles of the operation:

- Transparency
- Supporting important social issues
- Community deposit and loans
- Responsible bank lending
- „Pay as much as you like” account management fee

The EUKI HETES financial mechanism:



EUKI Allies HETES project

Hungarian example:

- a town in Zala with 10 000 inhabitants (tourism is important)
- thermal bath owned by the local government (lack of capital, bank loan is needed for development)
- planning a solar panel system to cut costs of operation of the thermal bath (investment of 143 000 € for a 100kW powered solar system)
- 100 local community members with 1430 € deposits each can ensure the bank loan till the end of the project while their deposits get favorable interest
- the return period of this project is

  approximately 4.5 years

9

Jointly providing flexibility and grid services while charging EVs

Tereza Borges, Lumenaza, Germany / UK

Lumenaza

Jointly providing flexibility and grid services while charging EVs

Tereza Borges
International Business Development

April 2020

Lumenaza

Accelerating new energy. Together.

Lumenaza develops powerful software to connect producers and consumers of green distributed energy, providing everyone access to the energy market.

Founded in:
2013

Employees:
37

1.5 bn data points per year
> 200,000 bills per year

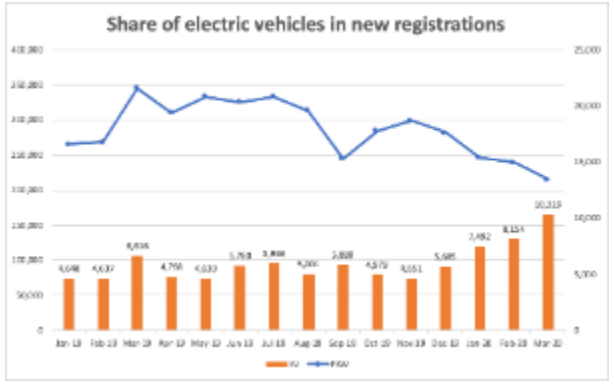
Countries active:
4

Jointly providing flexibility and grid services while charging EVs

Electric Vehicles (EVs) are on the rise

Worldwide annual EV sales will hit 11 million by 2025 and 30 million by 2030. (*)

(*) Bloomberg New Energy Finance forecasts



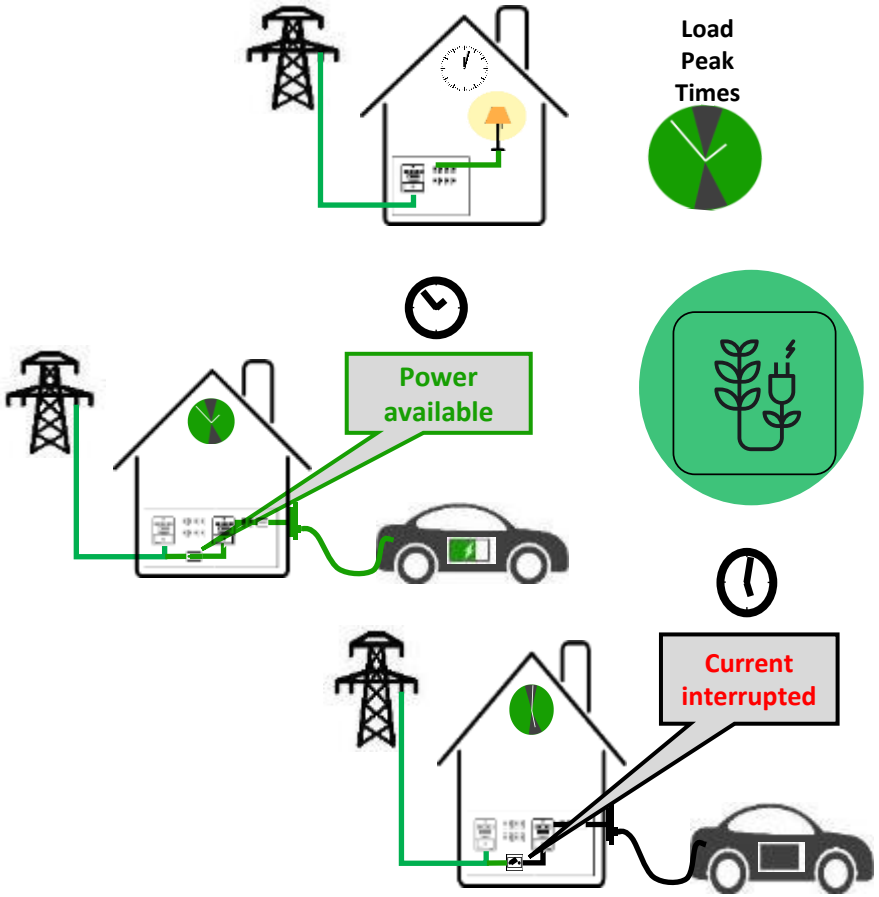
*"As a pooled resource, the growing number of **EV batteries** could provide a wider range of **valuable grid services**, **from demand response and voltage regulation** to **distribution-level services**, without compromising driving experience or capabilities",* Ofgem study.

The U.S. Department of Energy's INTEGRATE study has estimated that with **3 million EVs**—half of them using flexible charging and EV batteries as energy storage—**peak demand would fall 1.5 percent**. **Electricity costs would decline by 1 percent to 3 percent**. In addition, **renewable-energy curtailment would shrink by 25 percent** and overall grid emissions could shrink, too.

Control peak loads with community green electricity cheaper than a household tariff

T&T eMobil tariff

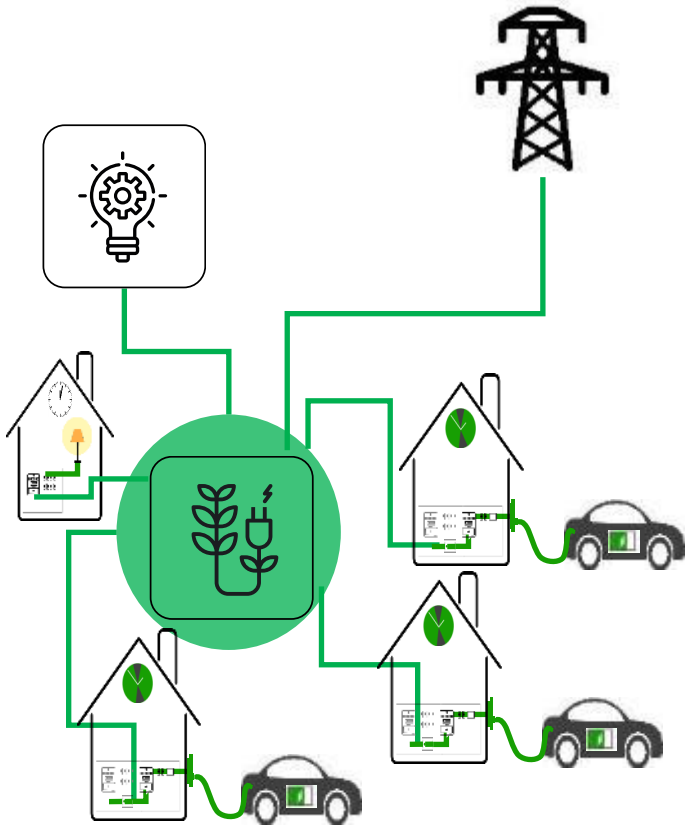
- Valid across Germany
- 20-25% lower than an average household tariff
  - Based on a special regulation of the Energy Industry Act.
  - Controllable consumer devices reduced network charges
- The local network operator can interrupt the supply if necessary.
- Green electricity
  - We buy the electricity from many producers throughout Germany and sell it to our consumers.
  - The electricity comes 100% from decentralized renewable energy sources.



Roadmap to realise the value of EV's flexibility

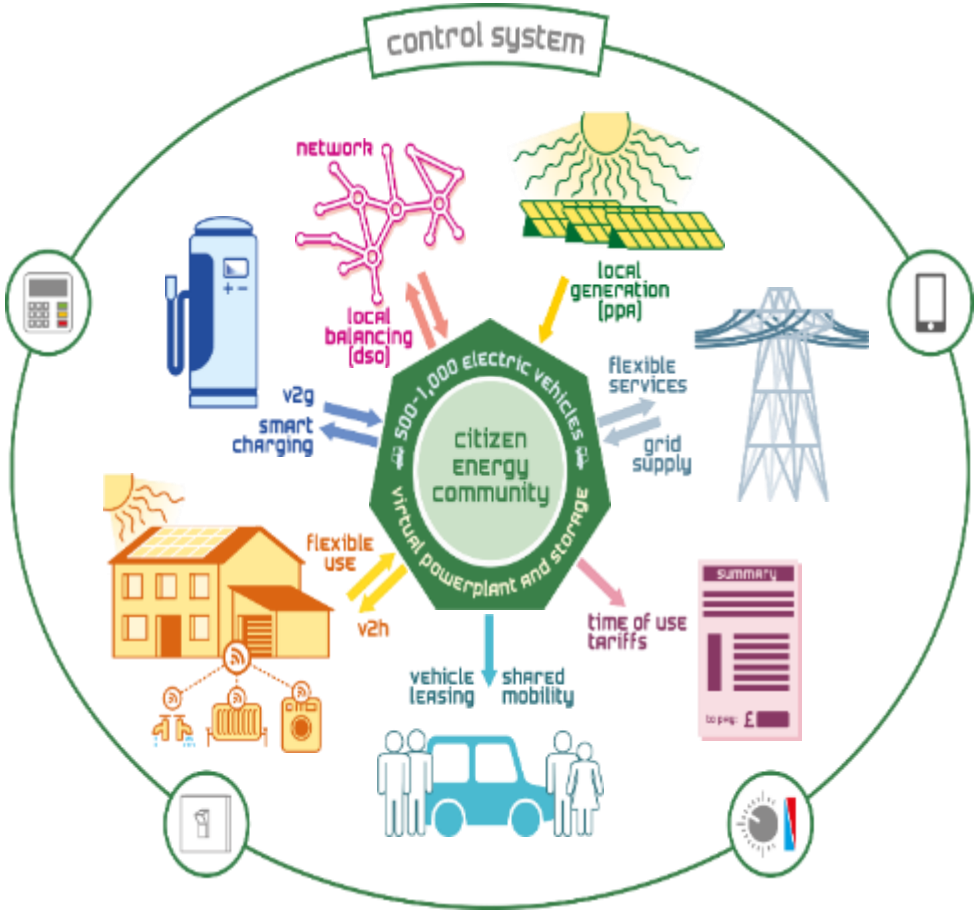
- What ?
  - Peak shaving - storage for the household
  - Grid services– aggregation of small scale
  - Grid storage - Minimise renewable curtailment
  - Harness EVs as a stored energy source, using parked cars rather than peaking plants
  - Remuneration for the flexibility

- Who?
  - Automotive O&M (Standardisation of charging and de-charging)
  - Grid operators ability to operate the commands
  - Renewable producers, prosumers and consumers (Community!)
  - EV owners
  - Energy as a Service platform (Lumenaza)



Jointly providing flexibility and grid services while charging EVs

- The current implementation aim to serve as baseline to be replicated/tailored by local, regional, national communities
- Citizen Energy Communities can Lumenaza's services to shorten the time-to-market and cost-to-serve, whilst keeping full control of the organisation and operations
- The exploitation of the EVs flexibility can help
  - Enabling CEC business case, driving societal benefits for all (both private / community shared assets)
  - Accelerating the decarbonisation not just the transport sector, but the power sector too



What we believe in

Lumenaza

Green distributed electricity will power the world. Everyone will shape and participate in the energy market.

Contact details

Tereza Borges
International Business Develoment

+44 (0) 7775404001

E-Mail
tereza.borges@
lumenaza.de

Lumenaza

Lumenaza GmbH
Kreuzbergstr. 30
10965 Berlin

www.lumenaza.de

Accelerating new energy. Together.

10

Digital Energy supply and demand response systems

Natalie Samovich, ENERCOUTIM

SMART CONTRACTS AND BLOCKCHAIN ENABLED SOLUTIONS WITHIN THE CONTEXT OF ENERGY COMMUNITIES

April 23, 2020

Natalie Samovich

"Advanced and interoperable digital business-to-business platforms for smart factories and energy", 16 October 2018

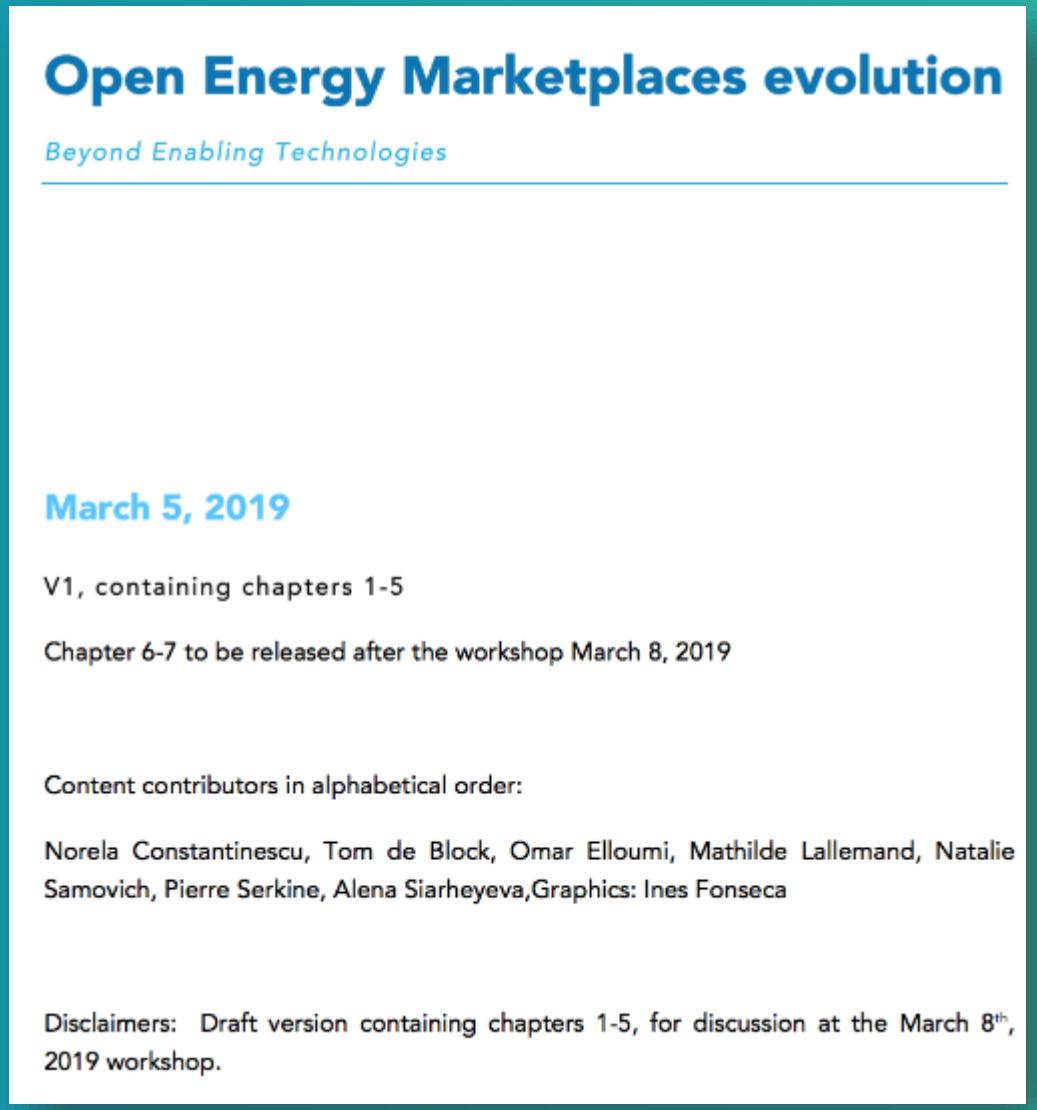
"Open marketplaces to spur innovative energy services", 22 October 2018

"Open energy marketplaces and the enabling technologies", 8 March 2019

"Digital energy marketplaces", 17 September 2019

"Data Driven Services for Energy Consumers", 17 January 2020

"Workshop Policies to Support Open Data Marketplaces", 29 January 2020



Open Energy Marketplaces evolution

Beyond Enabling Technologies

March 5, 2019

V1, containing chapters 1-5

Chapter 6-7 to be released after the workshop March 8, 2019

Content contributors in alphabetical order:

Norela Constantinescu, Tom de Block, Omar Elloumi, Mathilde Lallemand, Natalie Samovich, Pierre Serkine, Alena Siarheyeva,Graphics: Ines Fonseca

Disclaimers: Draft version containing chapters 1-5, for discussion at the March 8th, 2019 workshop.

BLOCKCHAIN-BASED SOLUTIONS FOR P2P POWER TRADING

"Blockchain enabled solutions can be implemented and unlock huge opportunities to have everyone participate and derive economic benefits in the new energy world using 'simple' interoperable and convenient platforms."

The potential (HIGH), challenges (MEDIUM) and first real-life experiences (MEDIUM)

Maturity of implementations:
more then 50% are at lower than TRL5;

Funding:
30% between internal, ICO, crowdfunding, VSs

Tech providers, fabrics:
great variety of providers with willingness to pick best fit for the goal

Source: AIOTI Blockchain Workstream Results of State Of The Art Survey, November, 2018

Internet of Things

Artificial Intelligence

Distributed Ledger Technologies

Governance Ethics

Building Blocks for more flexible highly participatory Multi Sided cross domain Marketplaces of the future

---

Aggregation and disaggregation layers

Units of operation APIs

Golden mile: interoperable, instant, scalable, transactive and secure Power platforms

Impact and not pure technology focus

- Facilitation of ecosystems enablement on generation and demand side. Incentives and price signalling. (VICINITY2020 Access generation triggering price signalling for electric charging, blockchain solution - wallet)

- Economic value creation and reaching climate change adaptation goals (certificates of origin Flexidao)

- Large cross domain marketplaces enabled by digital platforms

P2P exchange of energy surplus. Energy trading platform

prosumers exchange their energy surplus with their neighbors
- SonnenCommunity, Hive Power, OneUp, Power Ledger

cases are designed to enable energy trading among prosumers
- Energy 21 , Spectral, Sunchain , Verv

Energy provision

Prosumers choose local renewable generation through the companies
- Vandebron , Electron, Piclo, Dajie, Powerpeers

Crowdfunding platform for renewable energy generation plants

- Wepower

Renewable cryptocurrency or renewable certificate

- Flexidao, Solar Coin

Other

Security, Curtailment MGT, Flexibility management...
- Guardtime, Electron, Sonnen

Blockchain system prepares morning croissants under a six-building self-consumption project in France

In Prémian, southern France, a blockchain project developed by Sunchain is providing six consumers with solar power and certifying transactions – which also involve local distribution system operator Enedis.

JANUARY 10, 2019 EMILIANO BELLINI

COMMUNITY | GRIDS & INTEGRATION | HIGHLIGHTS | FRANCE

A mix of residential, community and commercial consumers share energy from one PV system in Prémian.

Decentralised smart energy at the heart of smart cities

Peer to peer energy marketplace to allow solar panels, green buildings, smart meters, Electric Vehicles to trade electricity in real time

Smart Energy Districts towards Green Smart Cities

+CITYXCHANGE


7 cities


testbeds

Green energy market place

- Positive green energy district
- 11+ testbeds
- Decentralised smart energy
- e-Mobility as a service

EU Horizon 2020 | 32 partners incl 7 Municipalities, business and academia | 30MEUR

10 + testbed environments across Europe

SOCIAL
Vision (DP02)
Co-create a Bold City Vision, to Plan, Implement, Replicate and Scale up to Positive Energy Districts and Cities

SOCIAL
Engage (DP03)
Co-create Positive Energy Blocks

LEGAL
Regulatory zone (DP04)
Enable innovation through regulation mechanisms

SOCIAL
Playground (DP05)
Accelerate change and disruptive solutions through innovation playgrounds

SPATIAL
DPEB (DP06)

PEB through Microgrids

TECHNICAL
EMaaS (DP08)
Integrate seamless e-mobility within the PEB

TECHNICAL
Local trading (DP09)
Enable Peer-to-Peer trading within the PEB

TECHNICAL
Flexibility market (DP10)
Enable a fair deal to all consumers through a flexibility market

ECONOMIC
Invest (DP11)
Enable consumers to invest in their buildings, which is critical to the creation of a PEB

Natalie_Sam

Natalie Samovich

n.samovich@enercoutim.eu

Classes of Energy Communities

No	*Name*	LEC Taskforce
class 1	Collective generation and trading of electricity	all types of territorial or commercial groupings of generators – whether active on the market or under feed-in mechanisms (often called Virtual Power Plants)
class 2	Generation-Consumption Communities	certified sourcing of electricity in a closed group of generators and consumers - not necessarily in proximity but including local or regional energy markets
class 3	Collective residential & industrial self-consumption	generation, storage and consumption in residential cases with multiple dwellings; includes Tenant-Power (Mieterstrom) - models
class 4	Energy positive districts	districts with residential and business entities operating their energy supply systems under their own regime
class 5	Energy islands	real islands or parts of the distribution system that can be operated standalone (e.g. cellular system as in SINTEG, holonic model as in PolyEnergyNet)
class 6	Municipal utilities	existing organizations for energy production, supply and grid operation under citizens' control – directly (e.g. cooperative) or indirectly (e.g. controlled by local government)
class 7	Financial aggregation and investment	a "community" of investors joins to scale the amount of or manage the investment in generation systems (without further involvement in organisation etc.)
class 8	Cooperative Financing of Energy Efficiency	citizens jointly investing in efficiency means of SMEs and municipalities, possibly in their own region (e.g. contracting / ESCO, crowd-funding
class 9	Collective service providers	all types of commercial groupings of energy services (e.g. grouping of EV charging stations, aggregation of demand side management services)
Class 10	Digital supply and demand response systems	all types of digitally controlled energy systems (e.g. implemented with blockchain), these days possibly operated as a sandbox-model

Join us!

on expera for the co-creation of knowledge

>>> https://t1p.de/usr9

- comment and edit living documents
- participate in surveys
- support creation of recommendations