

#### CITIZENS ENERGY COMMUNITIES

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### MOTTO

"A dollar saved is a dollar earned." The Future is Localware Not Globalware

Benjamin Franklin

Alvin Toffler?

#### I HOW IT STARTED



- 1. Centralized system of production, distribution and consumption was good as long as it provided cheap and stable energy.
- 2. Pollution was rising with increased production meeting growing consumption.
- 3. Rising emissions of  $CO_2$  are harmful to the climate.
- 4. New technologies basing on Renewables are harmful to the old system the Peninsula syndrome. In Poland at 11.00 on 2.03.2022 7 thousand MW in wind farms produced only 33 MW (source PSE).
- 5. The aim to reduce  $CO_2$  emissions is not possible to reach in the old system.
- 6. Rising prices and instability of delivery created the need to produce our own energy in local communities from small scale Renewables and local resources.
- 7. European Commission agreed with the "Vox Populi" and introduced Citizens Energy Communities into "Green Deal 2050".



Old and new system in a nutshell



#### **II STARTING DOWN, GOING UP**



- 2. Communities of a dozen / several hundred entities are much more efficient for example, "Osiedle Słoneczne" in the municipality of Kaźmierz, PL.
- 3. Self-sufficient communal communities Austria (Güssing), Germany (Feldheim), India (PV instead of diesel generators), Africa.
- 4. Directive (EU) 2018/2001 of the European Parliament and of the Council of 11.12.2018
- 5. Polish National Energy and Climate Plan (NECP) only 300 by 2030.
- 6. The new Energy Law provides for the OSE Register kept at the Energy Regulatory Office.

#### **III HOW TO BUILD A CEC**

- 1. Every house, apartment block or a farm has its own power plant 3 10 kW
  - photovoltaic FV
  - vertical wind turbine not higher than the level of the trees
  - hydroelectric power plant or micro PSH
  - biogas plant powered by circular economy waste
  - locally powered heat pump

2. Each entity generates as much as it needs, and the excess is fed into the grid or stored in the 'Power Bank' ( electric car ? )



3. The next logical step is to connect these individual entities.

Houses in the same area are already connected by low-voltage lines. Newly built houses can be connected to the network, or they can remain "off – grid"

Homes with power plants can also power homes without power plants.

4. Small, vertical wind turbines and power storage elements can be added.



5. It is necessary to install a "stabiliser" which can be:

- a biogas plant,
- pumped storage hydroelectric power plant,
- electricity and/or heat storage.

6. The power of such stabiliser does not need to be more than 20-25% of the total power of CEC.

7. **"Biogas Plant Plus"** is a very attractive concept of combining biogas plant – "soft" biomass with a "hard" biomass gasification installation. In this way, all biomass in the municipal circular economy stream will be used.

8. The cost of such a solution reaches 110% of a standard biogas plant.



#### **IV EXAMPLES**

1. At present developers are building housing estates powered by Renewables. Photovoltaic is commonly used.





Photo - Rozalin Complex, Lusówko

2. A model example is a complex "Osiedle Słoneczne" in the municipality of Kaźmierz, Wielkopolska. Over250 houses are powered by PV and small wind turbines.

An energy battery storage system is being built for the whole complex.

There are no gas nor solid fuels installations.





Photo - "Osiedle Słoneczne", Kaźmierz

#### V BARRIERS

- 1. Legislative chaos energy clusters, energy cooperatives, virtual prosumer, etc.
- 2. Lack of people with community attitudes unfortunately, politics destroys personalities.
- 3. Lack of specialists in the integration of renewable energy sources 30 years ago the same with computers.
- 4. Lack of legal possibilities for CEC to integrate heat generation and mobility.
- 5. Lack of legal possibilities to integrate biomass from circular economy streams both "soft" biogas plant, and "hard" gasification installation.
- 6. Lack of support for the construction of a local raw material base e.g.  $C_4$  tree plantations.
- 7. Lack of possibility to use local energy resources during the period of transition e.g. local gas.

POLISH CLIMATE FORUM



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# Thank you very much for your attention

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