DEVELOPMENT OF THE RURAL CVPP LOENEN
AGENDA

- WHO?: Intro on "Loenen op de Veluwe" (community)
- WHY?: Our journey to cVPP (context)
- HOW?: Development proces cVPP Loenen (community logic)
- WHAT?: First images cVPP Loenen (technical choices)
LOENEN OP DE VELUWE
(COMMUNITY)

• Village at the edge of the Veluwe, Provincie Gelderland, 20 km from German border
• Rural, green character, touristic but also some paper mill industry
• Population: ca. 3.200 inhabitants (approx. 1.300 households)
• Well organised village: 3 organisations with strong interconnections
  1. Loenen Energie Neutraal: bottom initiative aiming at energy transition with a revolving fund
  2. DPL/cVPP: community based Virtual Power Plant (INTERREG NWE VB)
  3. Energie Coöperative Loenen
OUR JOURNEY: FROM VILLAGE INITIATIVE TO cVPP-PROJECT (CONTEXT)

2013: winning €200,000
2014/5: create infrastructure Loenen Energy Neutral and execution of projects
2017: DPL Interreg VB project for scale up to 40% solar power in 2020
2018: start of cVPP and Zonnedorp Loenen
2019: founding Energie Coöperatie Loenen
2020: EMS and solar roof of 1 MWp
Crowdfunding for 138,000 euro (=20%)
Start on January 23, close on February 20
Result: 101% collected
Rest (80%) from bank
Obligation style participation with 4% ROI
Energy Coöperative Loenen also makes a profit
In recent years inhabitants and entrepreneurs have invested in sustainable projects in houses and companies

- Some 1.5 million euro are invested in PV: currently 1.2 MWp solar power in Loenen (275 households).
- In 2019 more than 1 million kWh generated in Loenen = ca 25% van household demand!
- Yearly some 200,000 euro energy cost are avoided and 500 ton CO2 emissions.
- In the near future at least an additional 1 MWp locally generated sustainable energy is anticipated, so more than 50% of local household demand will be covered!

These changes incorporate both chances and challenges! Corona-times show one of the challenges: decreased demand leads to negative energy prices
CVPP: LOGIC NEXT STEP

Collective

↑

Energy community

Community-based Virtual Power Plant

Individual

Passive consumer

Prosumer

Smart prosumer

Consumption

Generation

Management
THE C OF CVPP! (COMMUNITY OWNERSHIP & GOVERNANCE)

- Bottom-up process instead of top-down
- By and for local inhabitants, not by an energy company or DSO
- Individual wishes and opinions count, but the end result is a compromise of many.
- Shared values and interests are leading
HOW: DESIGN PROCES CVPP (COMMUNITY LOGIC)

- 5 workshops in Q1, 2019
- Explaining the challenges and choices
- 100 participants
- Plus personal questionnaire to avoid peer pressure
PROCES CVPP-DEVELOPMENT (COMMUNITY ENGAGEMENT)

+ an individual questionnaire
RESULTS QUESTIONNAIRE (COMMUNITY NEEDS/GOALS)

Uitkomst op de vraag: "Welke waarde vindt u het meest belangrijk?"

- Financieel: 21%
- Institutioneel: 17%
- Klimaat: 28%
- Technologie: 28%
- Sociaal: 8%

N=66

Uitkomst op de vraag om elke waarde individueel te waarderen (1-10)

- Financieel: gemiddelde 6.5, standaarddeviatie 1.9
- Institutioneel: gemiddelde 7.1, standaarddeviatie 1.9
- Klimaat: gemiddelde 7.3, standaarddeviatie 2.0
- Technologie: gemiddelde 6.8, standaarddeviatie 2.2
- Sociaal: gemiddelde 4.3, standaarddeviatie 2.0

N=66
System with 45 participants now, 15 to add after installation of Smart meter, final goal 100 participants at end of project
CVPP — EMS COMPONENTS

- Algorithms form the “intelligence” and are “programmable”
- Needed:
  - Consumption data
  - Production data
  - Forecast data (weather)
  - Cost data, CO₂ data, market data, … data
  - Steerings possibilities, load changing, time shifting, curtailment
CVPP-DASHBOARD FOR TOTAL GROUP

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  - Steerings possibilities, load changing, time shifting, curtailment
CVPP-DASHBOARD FOR AN INDIVIDUAL
CVPP – CONTROLLABLE LOADS

- Nibe can be controlled by a cloud-based solution: water booster on. Only hot water storage will be heated.
- Mitsubishi can be controlled by a gateway solution: Recommended on. Hot water storage and room temperature will be heated.
- Charge point operator Newmotion was not willing to cooperate.
- Alfen charge point can be controlled but is not yet available in Loenen (underway?)
- Solaredge and Enphase converters can be monitored.
- Solaredge converters can be controlled by a cloud-based solution but for now this seems too expensive.
- Omnik and Enphase did not cooperate.
- 1 MW PV roof has SofarSolar converters, SofarSolar is willing to cooperate.
LONG TERM VISION ON LOENEN EMS

Relevance EMS will depend on:

Controllable assets

Activities
✓ Selfconsumption
✓ Dynamic pricing
❑ kW max
❑ Flexibility & balancing market
❑ Selling overproduction

National transposition of EU legislation (Winter Package)
THANK YOU FOR YOUR ATTENTION!
ANY QUESTIONS?