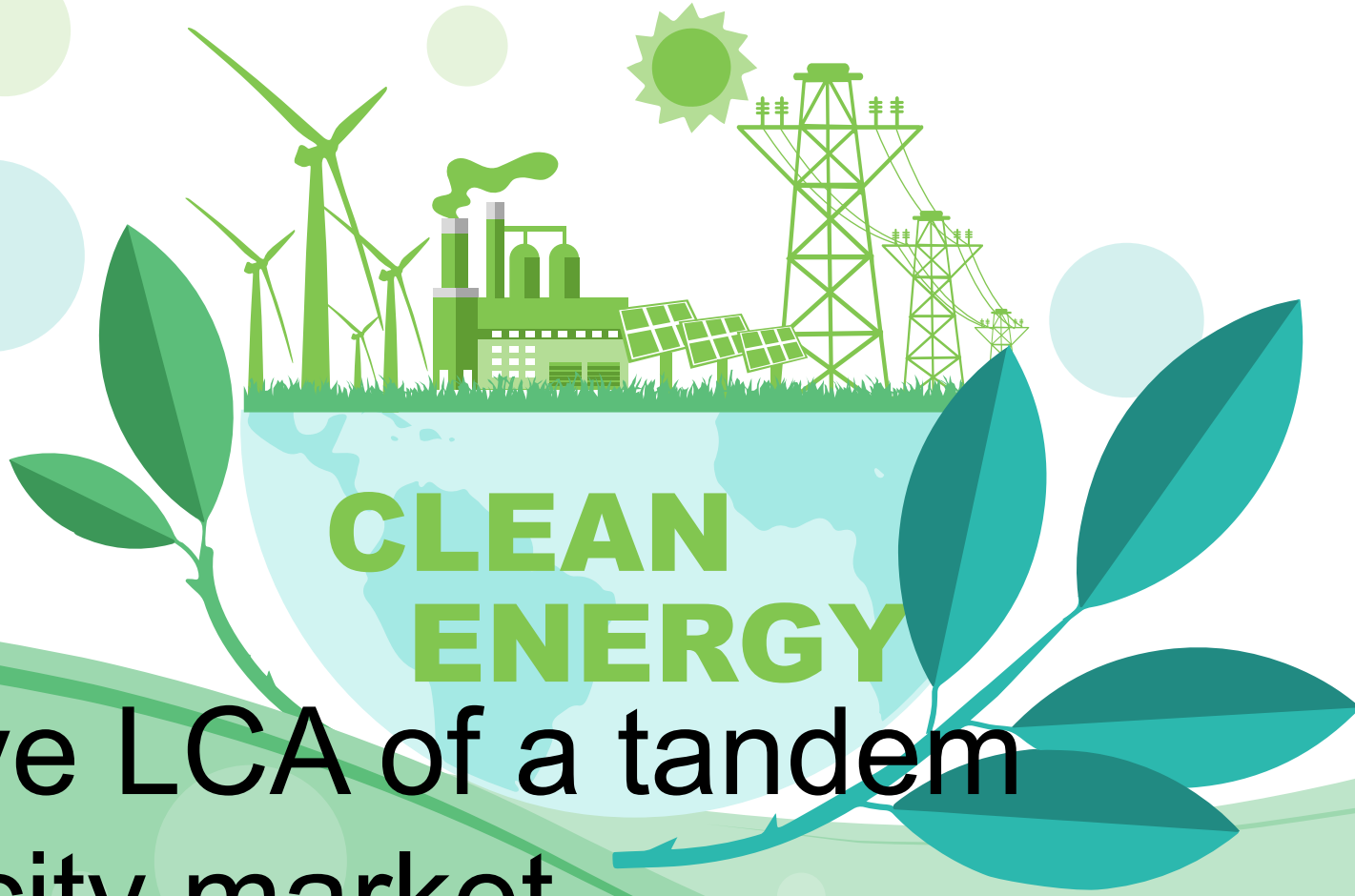


Prospective LCA of a tandem PV electricity market

Group 1

Alicia, Mitchell, Evelina, Julian and Stefany

28.10.2022

Agenda

01 Motivation

02 Goal

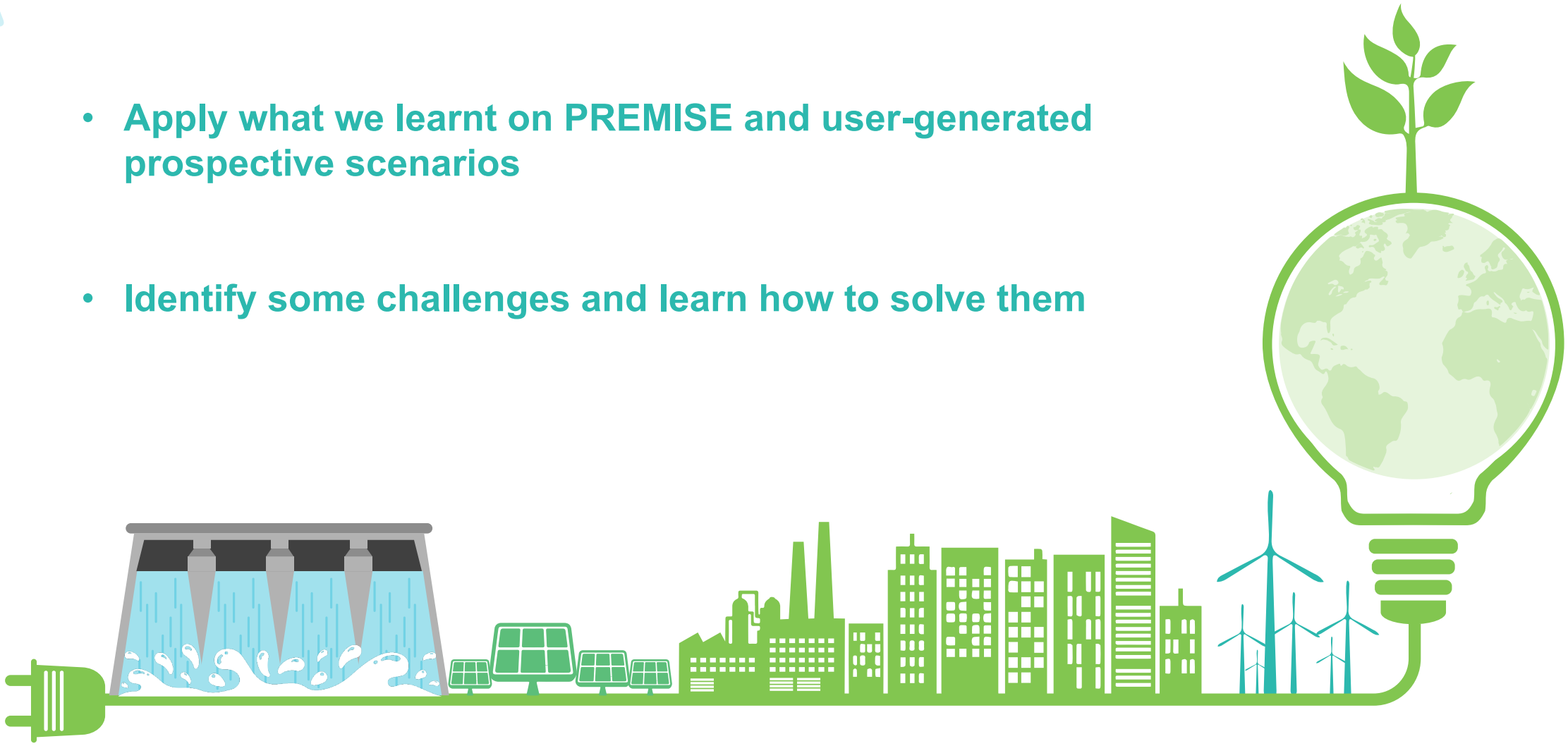
03 Methodology

04 Results

05 Conclusion and Feedback

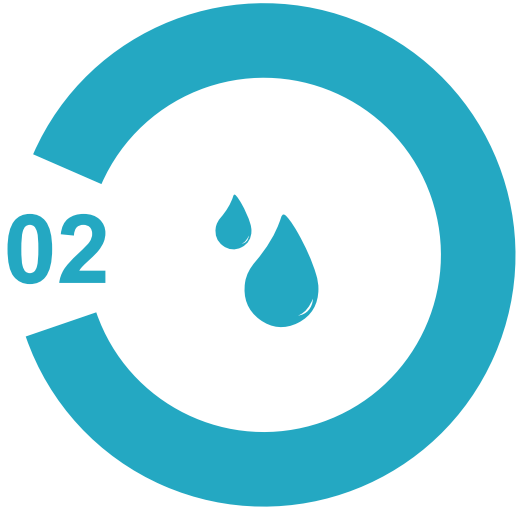
Motivation

- **Apply what we learnt on PREMISE and user-generated prospective scenarios**
- **Identify some challenges and learn how to solve them**

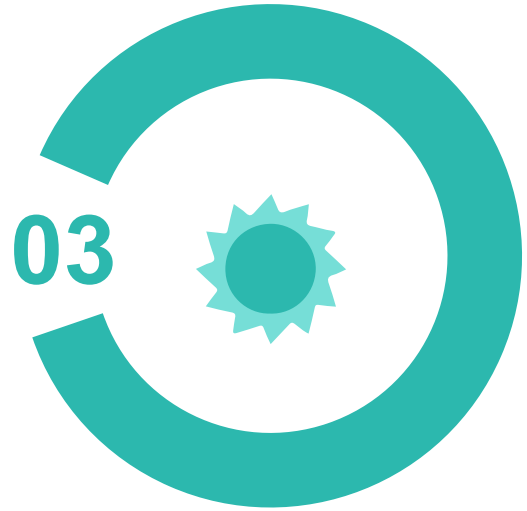


Goal

Apply what we learnt about prospective LCA and regionalization to a use-case



Analyze the potential environmental impacts of introducing a perovskite PV technology into the German electricity market



Analyze the effects of including the IAM into the background for our specific use-case

Use-Case: Prospective LCA of electricity market with a Perovskite PV technology

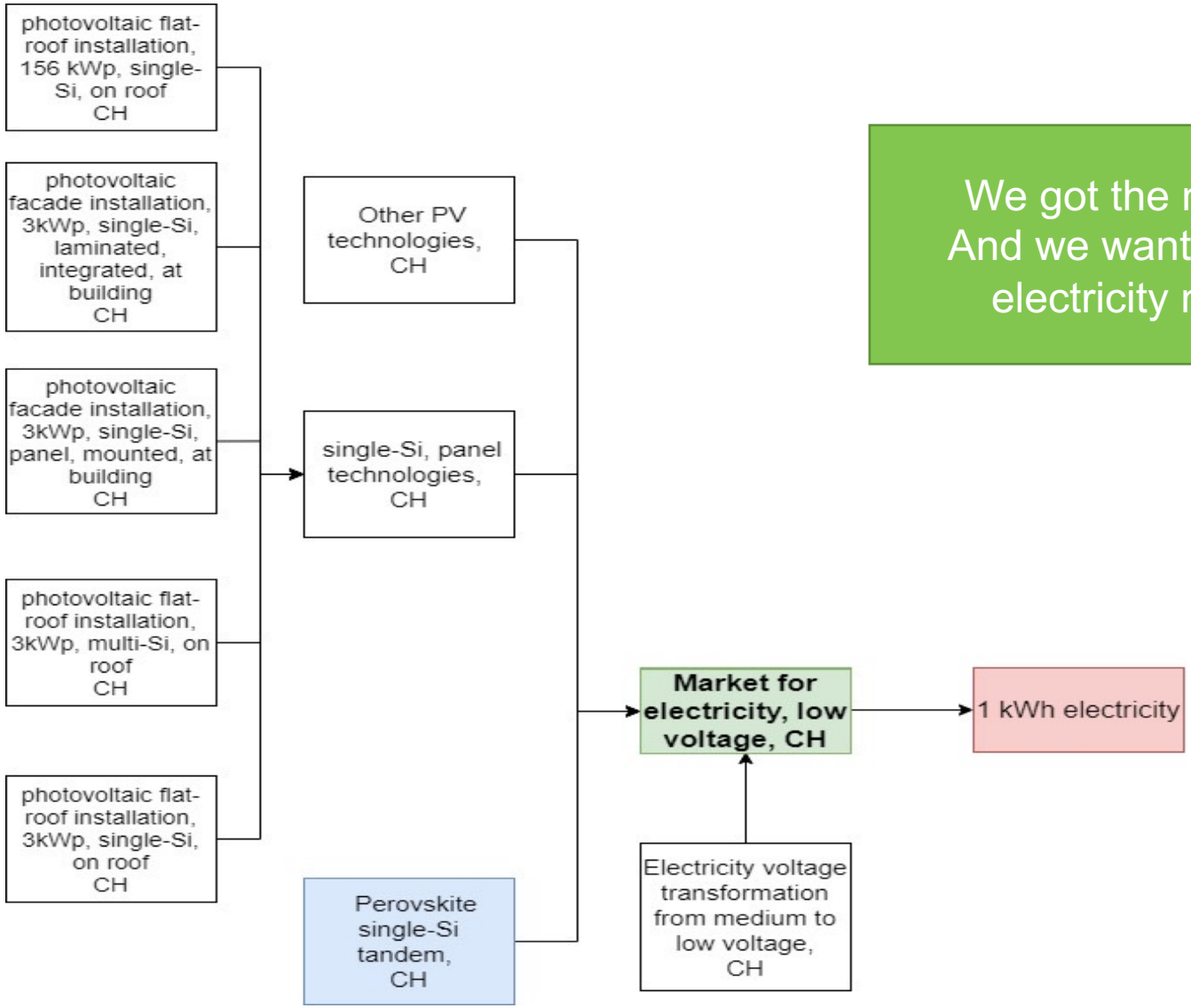
F.U: **1 kWh electricity produced by the electricity low voltage market including a Perovskite PV technology**

Goal: **Compare the following databases with PREMISE for the year 2050:**

- **Without new technology**
- **Including the new technology and without IAM**
- **Including the new technology and IAM**

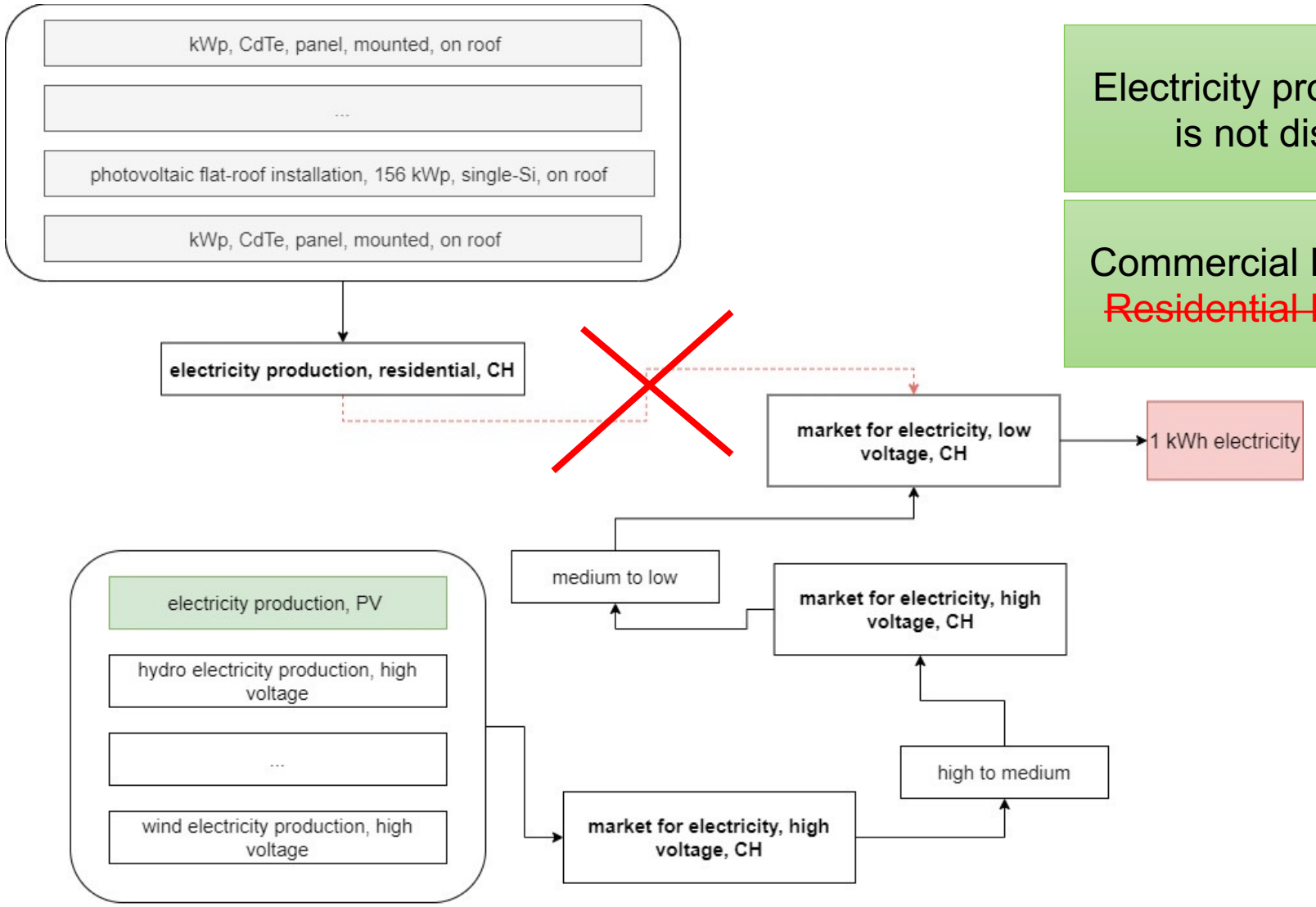
Source: https://nfp-energie.ch/de/projects/955/

Use-Case: Prospective LCA of an electricity market with a Perovskite PV technology



We got the new inventory!
And we want to add it to the electricity market in CH

Current status: user-generated scenario of the market for electricity, CH



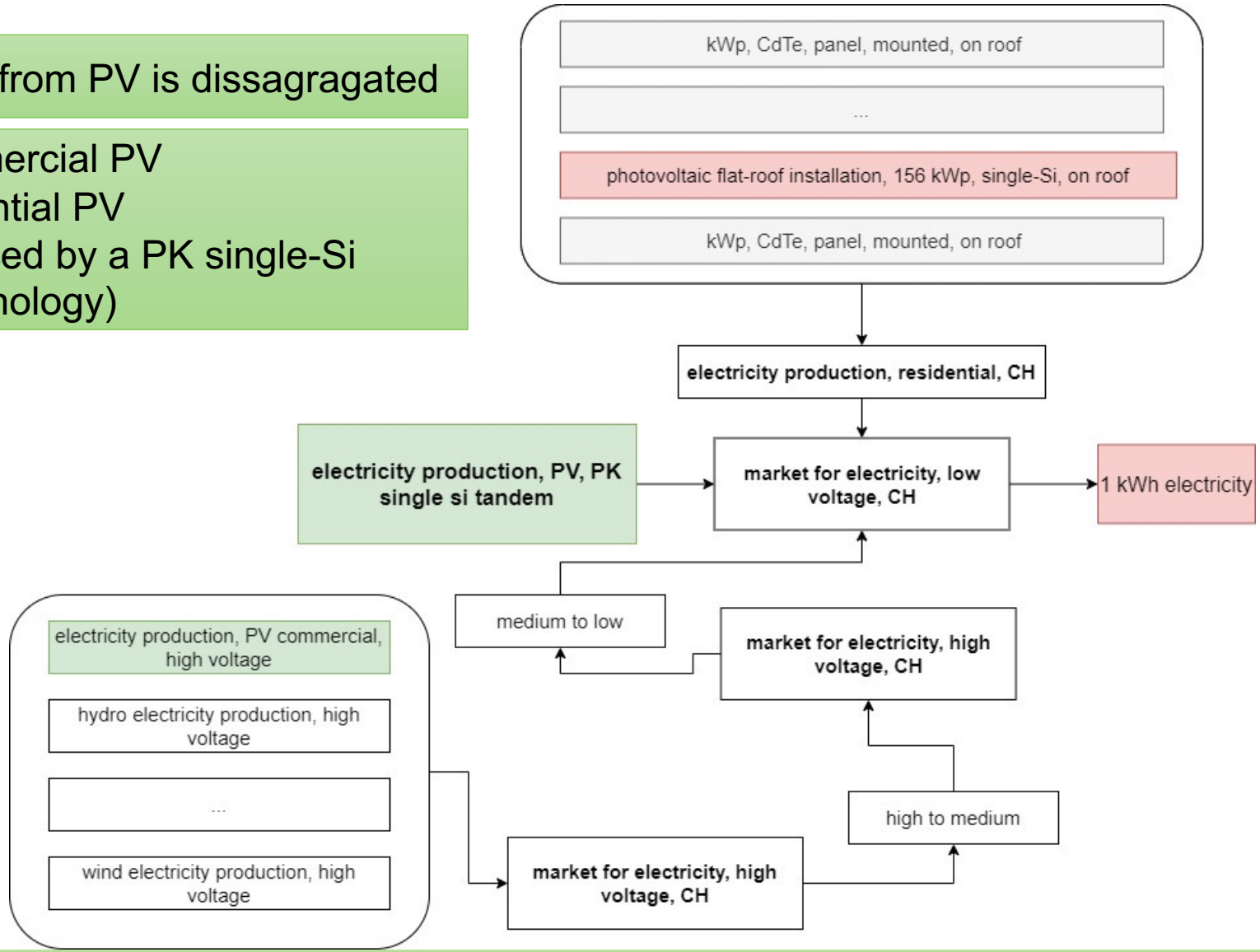
Electricity production from PV is not dissagragated

Commercial PV (high voltage)
~~Residential PV (low voltage)~~

Our user-generated scenario of the market for electricity, CH

Electricity production from PV is dissagragated

-high voltage → commercial PV
-low voltage → residential PV
-every single-Si replaced by a PK single-Si tandem (new PV technology)



So.. What does this mean?

The most challenging part!

1. Adjust the config.yaml

We need:

1. To understand how the current user-generated scenario of the market for electricity, CH is modelled.
   - **PV is not dissagragated**
2. To add *new production pathways* for pv commercial, pv residential and the new pv technology
3. Add efficiency variable (that describe the depletion of the old technology)
4. Adjust the markets for these new inputs
5. The inventory of the new PV technology

2. Adjust the scenario-data.csv

We need:

1. Need to define scenarios (data of evolution annual production volume of the country per technology)
2. We need to calculate the share of KWh comming from residental PV and commercial PV (provided by PV-lci from Premise)
3. To know the amount of installation per PV technology and their contribution used in the CH market (provided by PV-lci from Premise)
4. Estimate a depletion rate of the old technology (every tech that has single-Si) (we just assumed)
5. Calulate the annual of production volumen that decreases in the old tech and increases in the new tech for each year and scenario
6. Adjust the annual production volumen for each year (high voltage, high to medium, medium to low)

So.. What does this mean?

3. Adjust the new-lci.csv

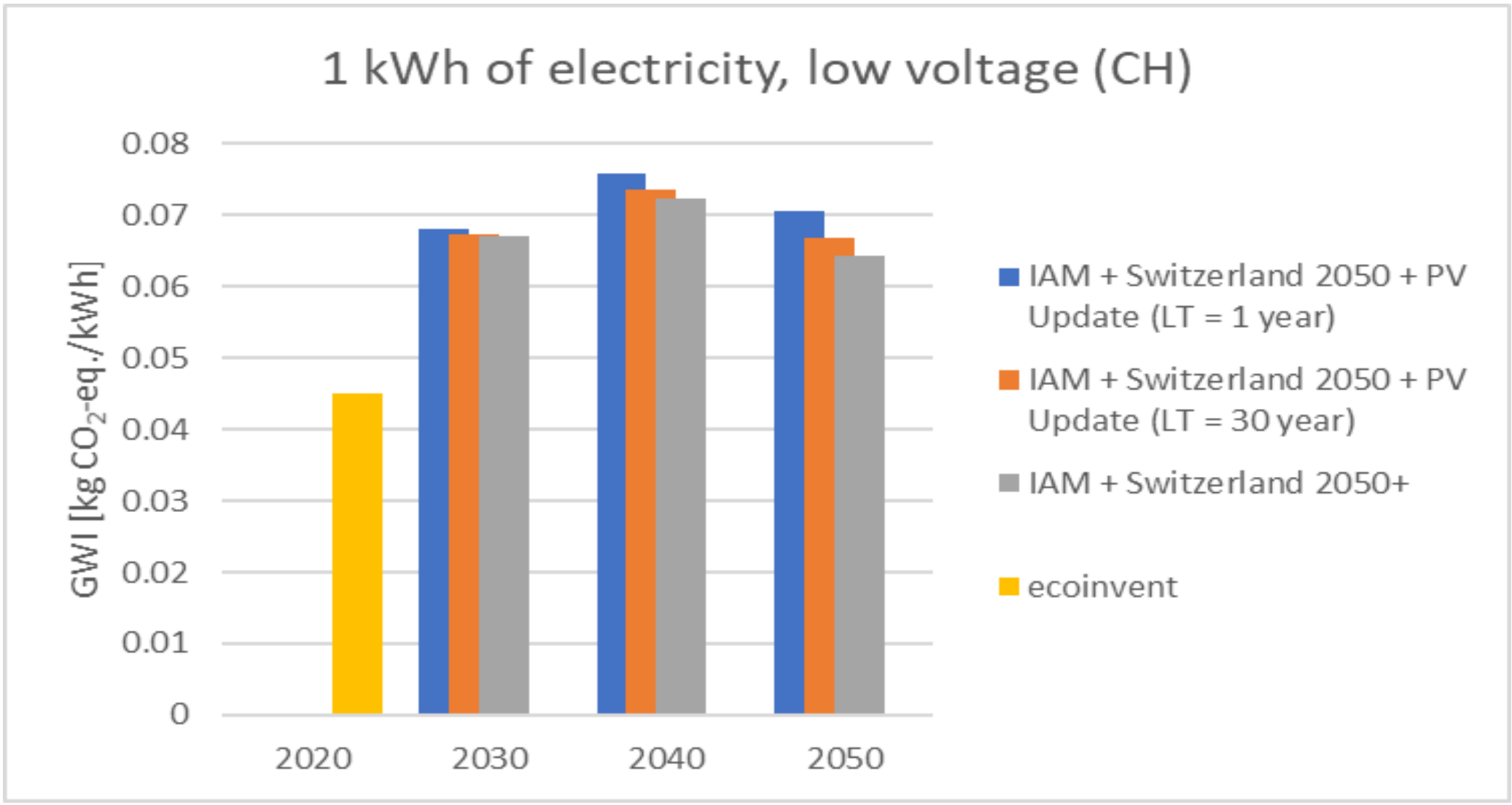
Premise allows one single lci file…
We need to add our new inventory to the already existed lci.csv

Careful! Excel transformed „ ,“ to „ ; “

4. Adjust the datapackage

Add new scenarios, check that the name of each scenario matches the one defined in the scenario-data

R E S U L T S


1 kWh of electricity, low voltage (CH)
GWI [kg CO_2-eq./kWh]
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2020
2030
2040
2050
IAM + Switzerland 2050 + PV Update (LT = 1 year)
IAM + Switzerland 2050 + PV Update (LT = 30 year)
IAM + Switzerland 2050+
ecoinvent

From your mistakes, you learn…

- Check which datasets are already available in Premise
- Syntax mistakes
- Capital letter in the name of the scenario data
- Line breaks in the comments of the inventory is not accepted
- Extra empty rows in between activities and exchanges
- Indentation in the config file
- Spaces and the names can make problem
- Github problem (private did not allow to share files)
- Github takes some time to update the repository
- Work-intensive to properly define the config.file

Thank You

Insert the Sub Title of Your Presentation