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Photovoltaic and Solar-Thermal Use Case Application Comparison with Witness Simulation and DCF Analysis

Bernhard Heiden[1,3], Karl Gaugg[1], Volodymyr Alieksieiev[2], Bianca Tonino-Heiden[3]

[1]*Carinthia University of Applied Sciences, Villach, Austria, b.heiden@fh-kaernten.at;*
[2]*TU Hamburg: Institut für Produktionsmanagement und –technik, Hamburg, Germany;*
[3]*University of Graz, Graz, Austria*

(Ia) Motivation and Introduction:

- EU Green Deal and EUTAX Regulation
- DCF Theory
- Production Portfolio Theory and Risk Evaluation [HT23a; HT23b; Hei+]

(Ib) Aim and goal:

- Use Case for Photovoltaic and Solar Thermal Application
- Modelisation: Witness, DCF & Risk Landscape

(II) Photovoltaic and Solar-Thermal Use Case Application Comparison with Witness Simulation and DCF Analysis

Local solar (sun) global power (Graz, Austria)	1.206,4 $\frac{kWh}{m^2}$
Available area at parking house C&P Immobilien AG	1.222 m^2
Photovoltaic system efficiencies	16,57 %
Solar Thermal system efficiencies	35,75 %

Figure 1: Key Parameters according to [Gau23]

- Photovoltaic and Thermal Model

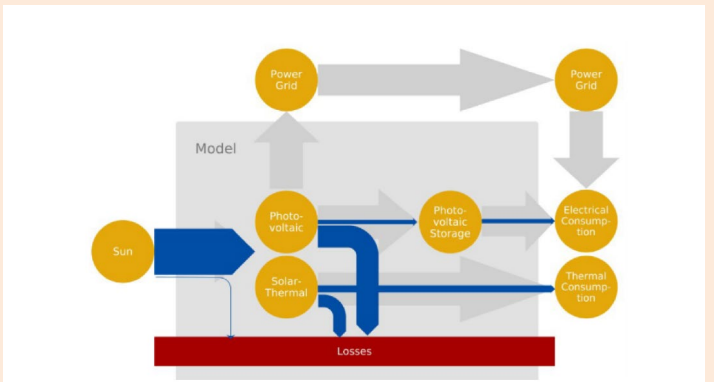

Figure 2: Model for simulation of comparison of photovoltaic and solar thermal (Model 2)[Gau23].

- Witness Photovoltaic and Thermal Model

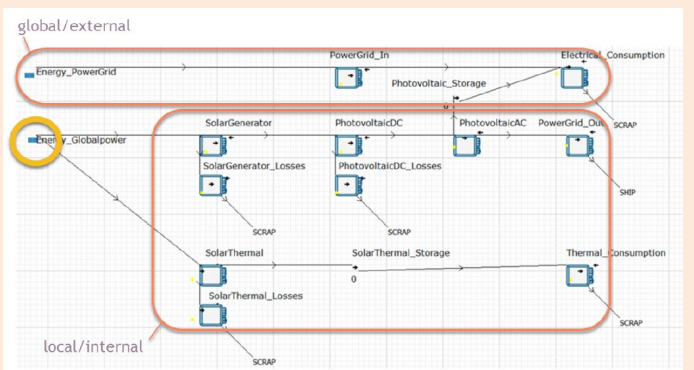

Figure 3: Model and Simulation in WITNESS Horizon [5] (Model 2). The Witness Files are also supplied at [HG24].

(III) Simulation Results:

Scenario	Description Scenario
[0.]	without investment 270kWh p.a.
[1.]	photovoltaic + storage + solarthermic 230kWh p.a.
[2.]	photovoltaic + photovoltaic storage 230kWh p.a.
[3.]	photovoltaic + storage net 230kWh p.a.
[4.]	photovoltaic + photovoltaic storage 270kWh p.a.

Figure 4: Scenarios

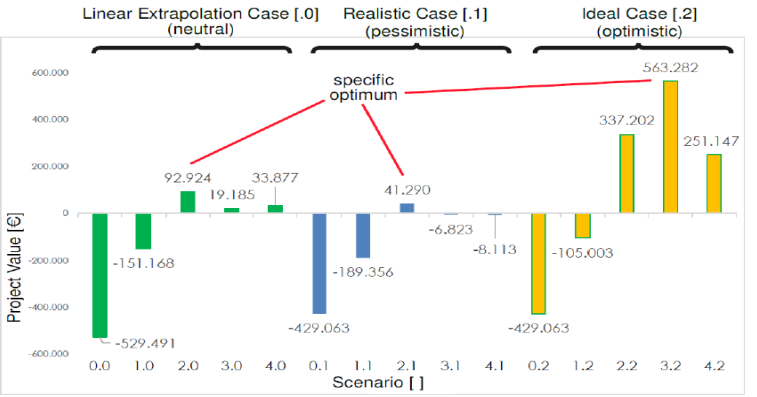

Figure 5: DCF project valued of different scenarios in the risk landscape (neutral/pessimistic/optimistic) (see also [Gau23]).

(IVa) Conclusion:

- Presented Witness Model for Simulation of Solarthermic and
- Photovoltaic Installations & DCF evaluation
- Industrial Application of this Model
- Explicit Consideration of Risk

(IVb) Outlook:

- Integration of the DCF Model in Witness
- Further Industrial Applications
- Risk Analysis Refinement with, e.g. Artificial Intelligence (AI)

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Thank you cordially for your attention!

FH-Prof. Mag. DI Dr. Bernhard Heiden, MBA[1], Karl Gaugg, BSc
Volodymyr Alieksieiev, BSc. MSc. & MMag. Bianca Tonino-Heide..

[1]Professor for Production Engineering
E-Mail: b.heiden@fh-kaernten.at
PS.: The presentation can also be found at:
http://www.dr-heiden.com/Vortraege.htm