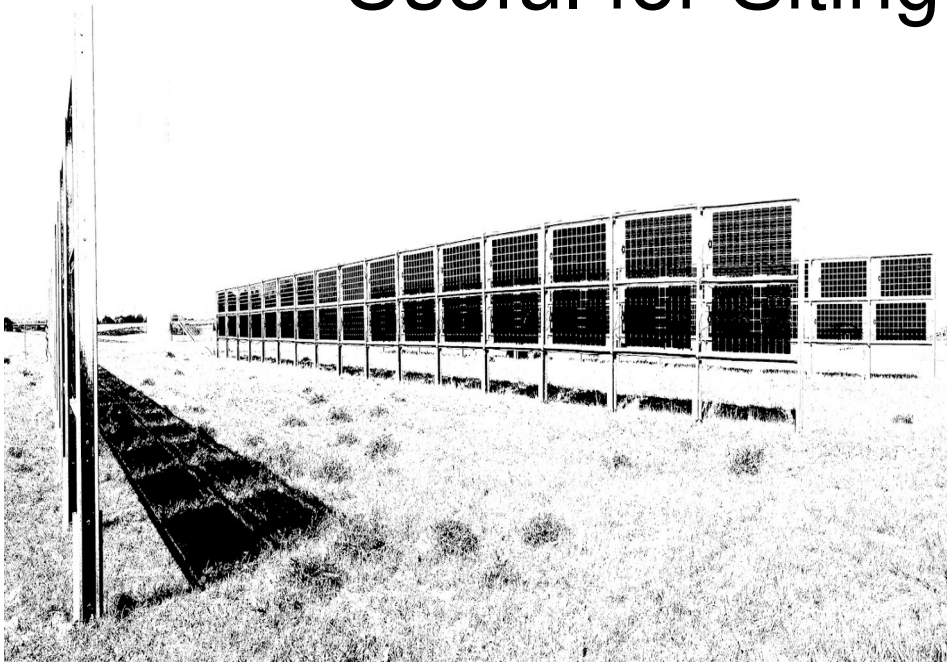


Energy production simulation of Agrivoltaic Systems

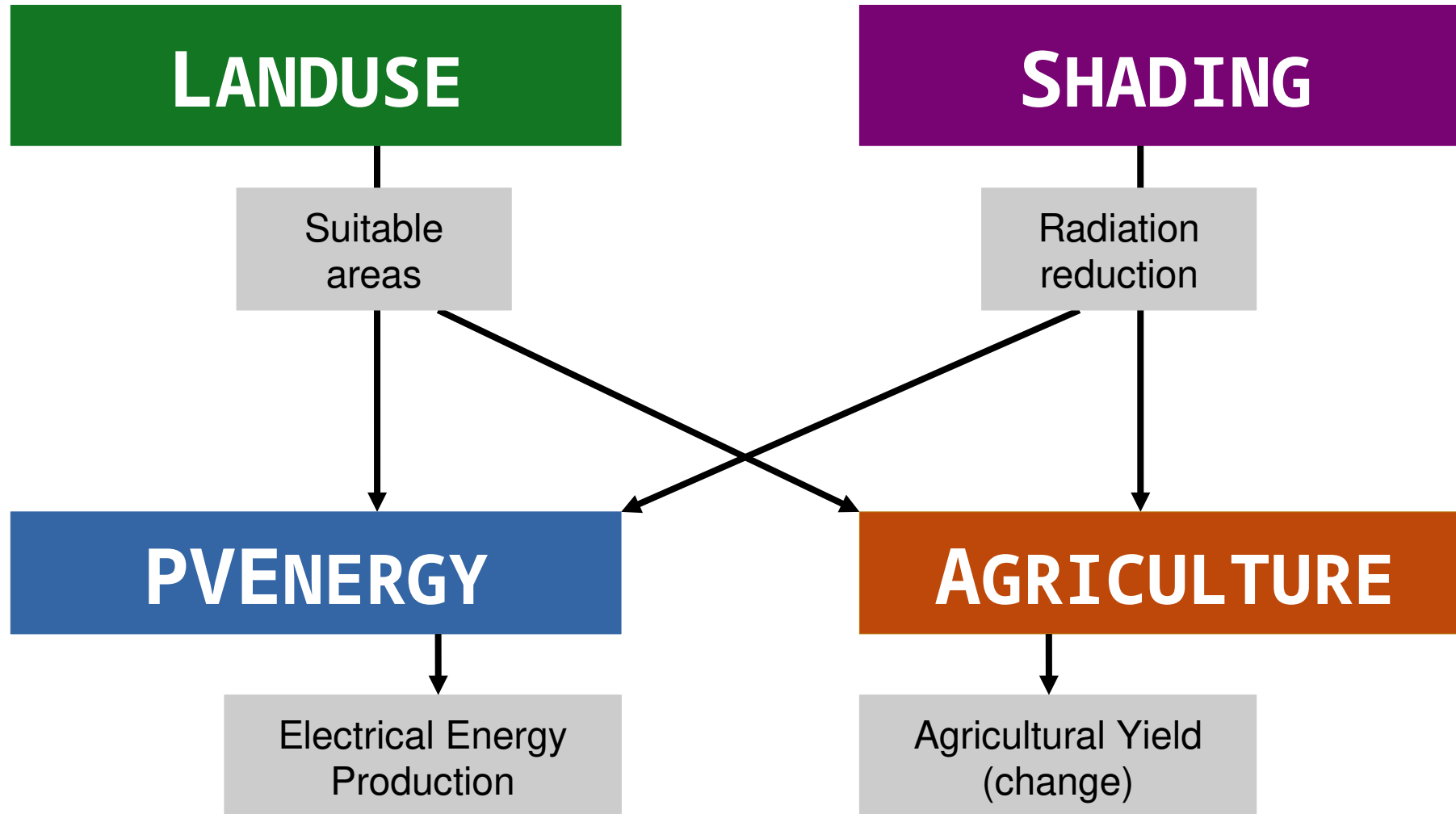
Christian Mikovits, Theresa Krexner, Iris Kral, Alexander Bauer, Thomas Schauppenlehner, Martin Schönhart, Erwin Schmid, and Johannes Schmidt

Agrivoltaic Simulation Framework

- Combined Simulation of Electrical & Agricultural Output
- Useful for Siting and Acceptance / Mitigation



Modules



Module: Landuse

Input

- Landuse Raster Data
- (DHM / DGM)

Output

- APV Polygons and Points



Module: Shading

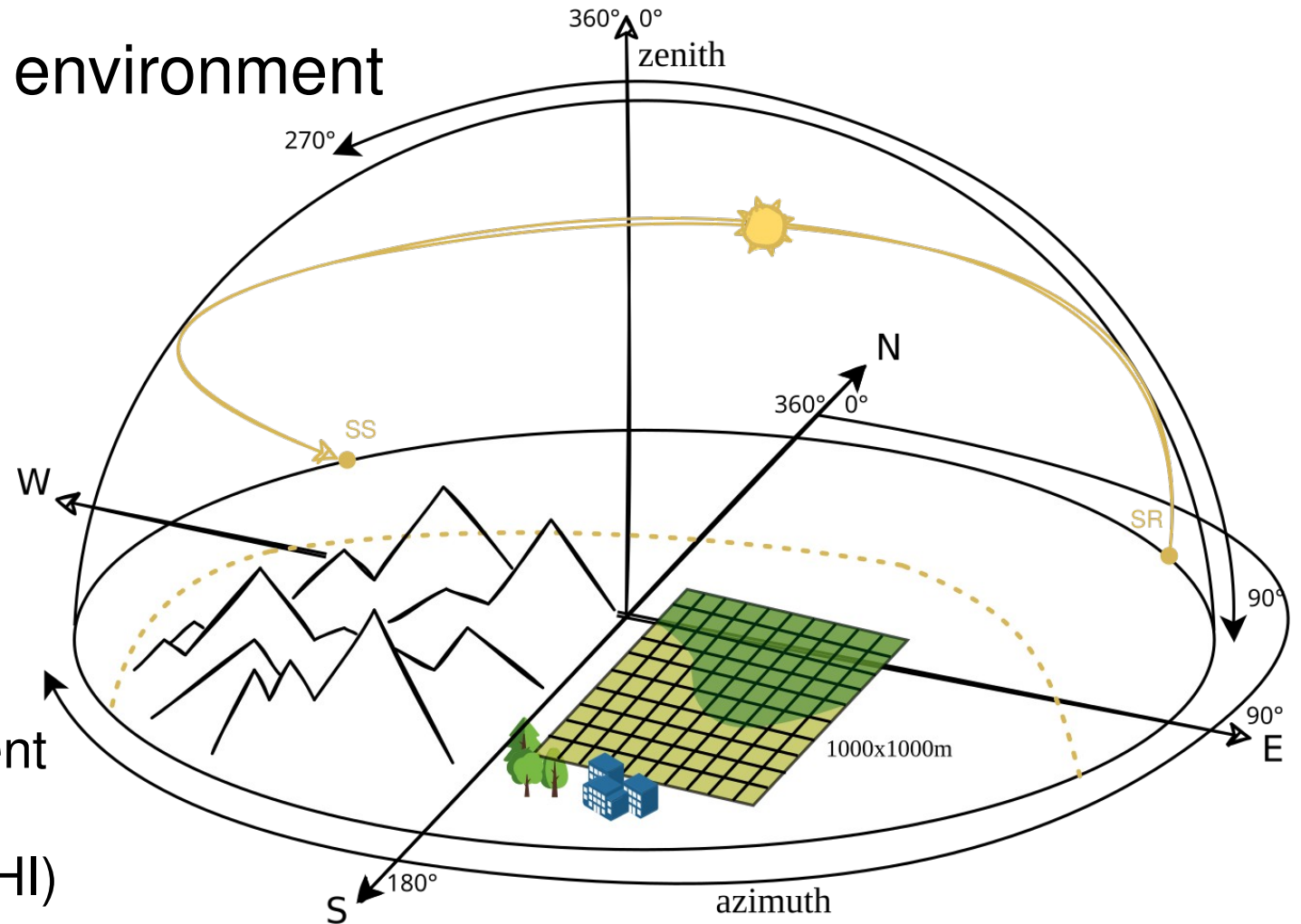
Component 1: Shading from environment

Input

- Points
- DHM / DGM

Output

- reduction factors from environment
 - direct normal irradiation (DNI)
 - diffuse horizontal irradiation (DHI)



Module: Shading

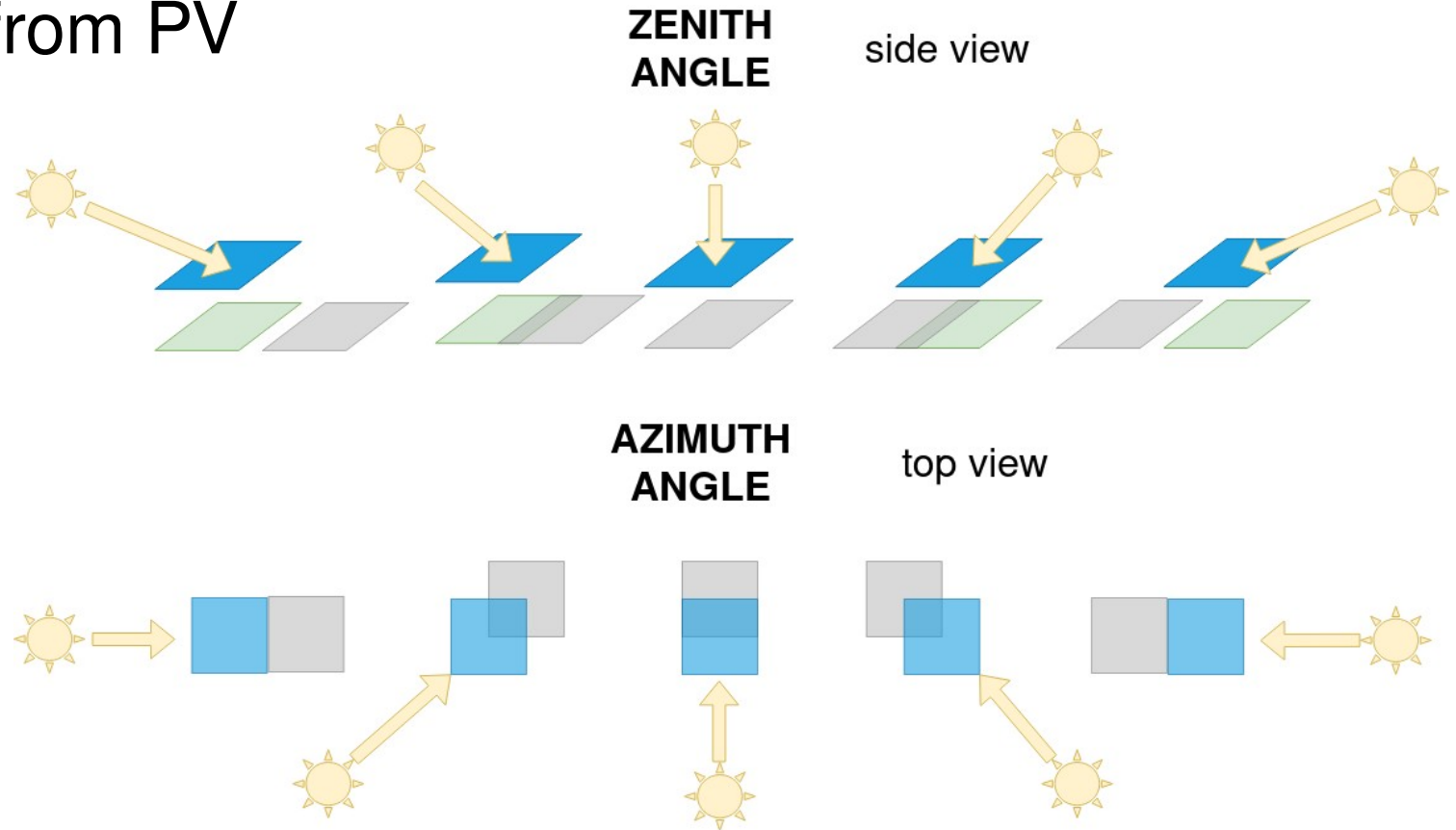
Component 2: Shading from PV

Input

- Points
- DHM / DGM
- PV System

Output

- reduction factors from PV
 - direct normal irradiation (DNI)
 - diffuse horizontal irradiation (DHI)



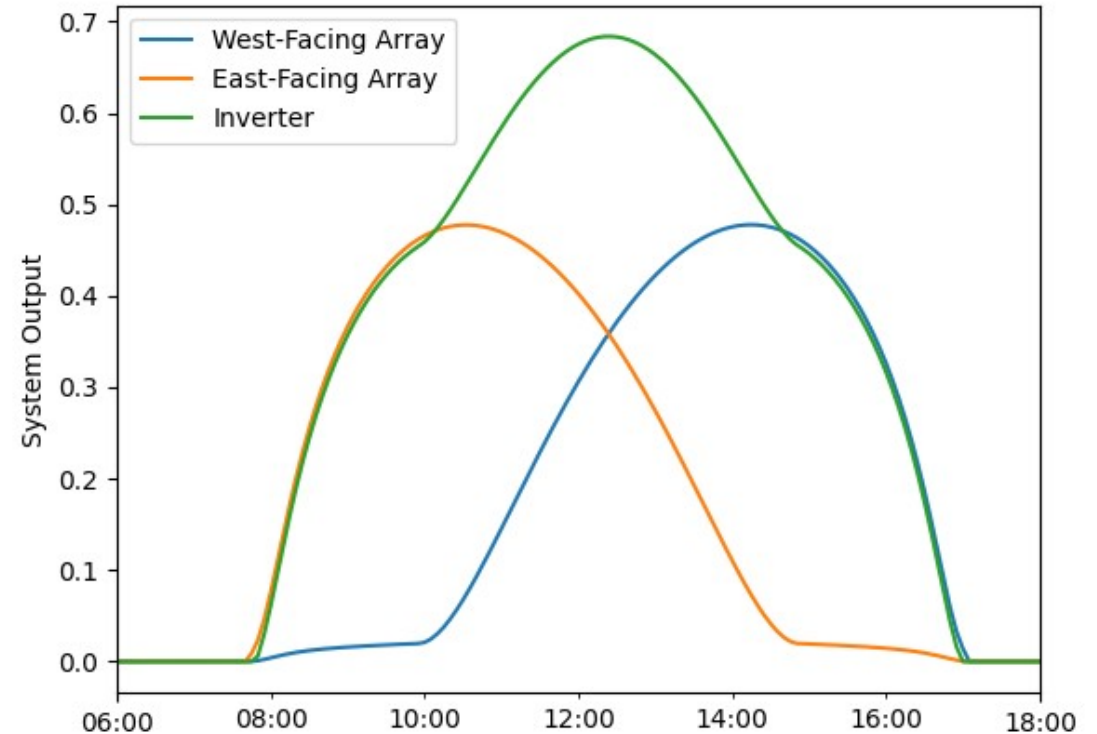
Module: PV Energy

Input

- Points
- PV System
- Radiation data (GHI)
- reduction factors from environment)

Output

- Hourly Electrical Energy Output



Module: Agriculture

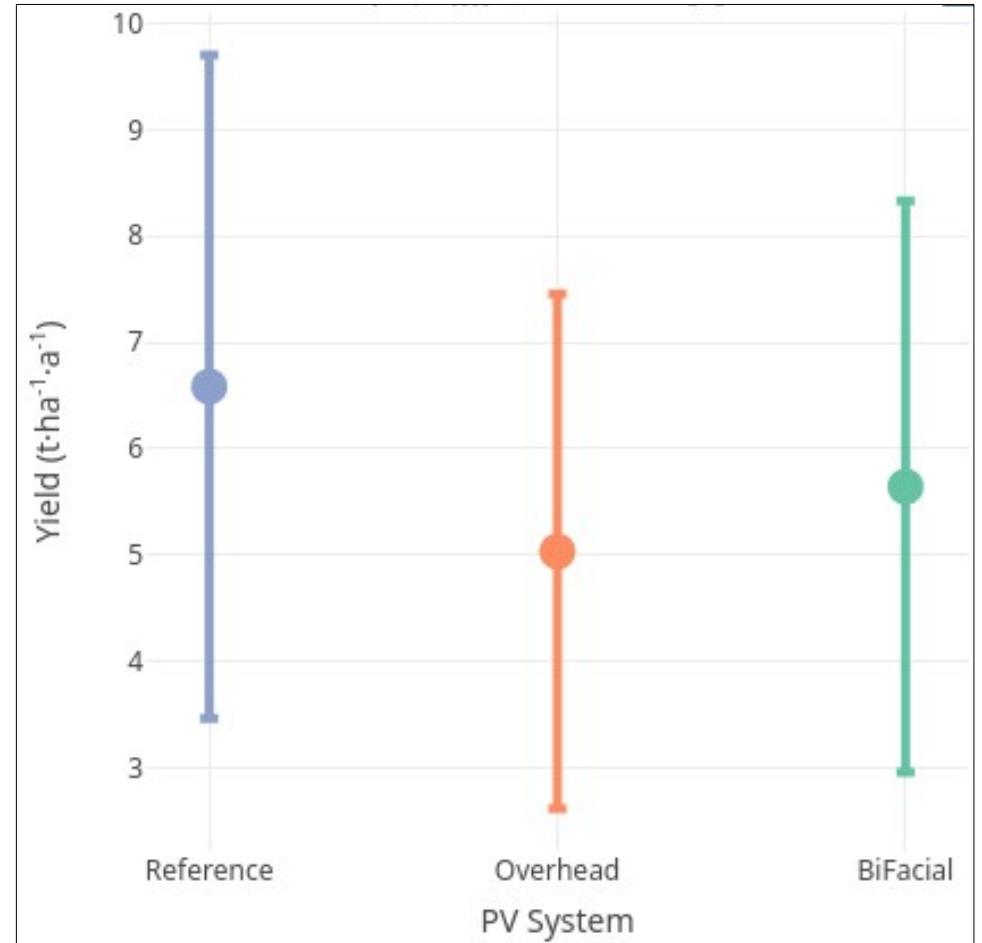
Input

- Radiation data (GHI)
- (reduction factors from PV)

➔ Model link to biophysical model (EPIC)

Output

- Agricultural yields by crop and crop rotation



Wrap Up: Agrivoltaic Simulation Framework

- AgriPV Framework from A- Ω
- Independent module usage
- Simplistic configuration
- configurable temporal and spatial resolution
- Available: <https://github.com/inwe-boku/renSpatial>