Jupyter notebooks as intermediary objects for energy modelling

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March 2023
Opening the source code

Opening the modelling process
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Opening the modelling process

Energy stakeholders

Model developers
Scientific community

Objectives
Assumptions

Data sets

Model

Results and findings

Scientific article

Statement

Open data
Open source
Open access
Notebooks as intermediary objects

- **Literate programming:**

  “Rather than indicating the computer what to do, let's focus on explaining human beings what we want the computer to do”.

  Donald Knuth, 1984

Notebooks as intermediary objects

Jupyter notebook

Energy modelling tool
Classes and functions

Tracé des puissances PV et consommation
La partie suivante permet d'afficher la puissance PV et la consommation annuelle

Entrée [15]:
• Chargement des données
  yearly_data = read_data(file_name='./data/consumption_and_irradiance_data.csv')
  yearly_irradiance = yearly_data[0]
  yearly_consumption = yearly_data[1]

Entrée [16]:
• plot
  fig2, ax2 = plt.subplots()
  ax2.plot(yearly_pv_power_values, label='Production PV')
  ax2.plot(yearly_cons_values, label='Consommation')

Un exemple de production PV et consommation annuelle

Development  Litterate programming
Notebooks set the context

- Article alone
- Article + Code
- Code & data
- Code, data & notebook
- Code, data, notebook & environment

- Understand
- Adapt
- Compare

Reproducibility
Conclusion

• **Uses**
  - Research supplementary materials
    - Waste heat recovery
    - Photovoltaic self-consumption
  - Teaching and mediation

• **Limits**
  - Versionning, and management of the computing environment
  - Participation: need for complementary materials & activities
  - Sustainability?

• **Resources**
  - Open and Reproducible Use Cases for Energy (ORUCE) methodology in systems design and operation
  - Methods and tools for a collaborative and open energy modelling process
  - Notebook template: .md; .ipynb