



# Sustainability in Physics Education for BSc/MSc

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# Why Sustainability in Physics Education?



**Urgent research topics! : Energy, Pollution, Water, ...**



Deep understanding of nature



Transversal skill: required by society



Responsibility: major consumer of planet's resources.

Mandatory course of general sustainability:

- University / Faculty level of coordination.



Optional course:

- Study plan is already FULL
- Courses are “packed” for specialisation.



Add-on to existing courses:

- Proper materials and contents are required.



## How to integrate to the courses and what are Challenges?

# Student's Voice

"Do you have any suggestions on how this course could further integrate aspects of sustainability (environmental or societal)?"

- No sense. This is pure physics course!
- It's already the case. It's enough.

- Stop printing exercises. We can see online.
- More natural light in the room
- Less air conditioner

- Talk about environmental cost when compare different technologies
  - More female course assistants

- Add sustainability contents in exercises
- Simulate forest fire
- AI safety, data centre operation and its impact
- Thermodynamics by case study
- Wind turbine, PV as TP topics with a clear sustainability context
- LN2 usage (some students play with it!)

# Opportunities and needs for lecturer's

- Material Sharing platform
  - Sustainability context and contents of lab & programming exercises (PV, Heat Pump, ...).
  - National level exchange which permits a development of educational contents based on local data (ex. MeteoSwiss Open Government Data (OGD)).
  - Contents developer's visibility increases.
  - SPS could help?
- Option: Project based course
  - Field work, ex. Physique dans la Forêt, F. Bouquet, Univ. Paris-Saclay

# References

- Nature Series: Physics and Sustainability  
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- Singh, V. How to teach climate change in a physics classroom. *Nat Rev Phys* **5**, 200–201 (2023). <https://doi.org/10.1038/s42254-023-00573-4>
- Sustainability Education 101 self-learning course  
<https://sustainabilityinacademia.org/news/sustainability-education-101/>
- Physique dans la Forêt, F. Bouquet, Univ. Paris-Saclay  
<https://qpes2023.sciencesconf.org/444090/document>