ELEC0018-1 Energy Markets

Lecture 0 – Class presentation

Damien Ernst

and

Matthias Pirlet

Adrien Bolland

Victor Dachet

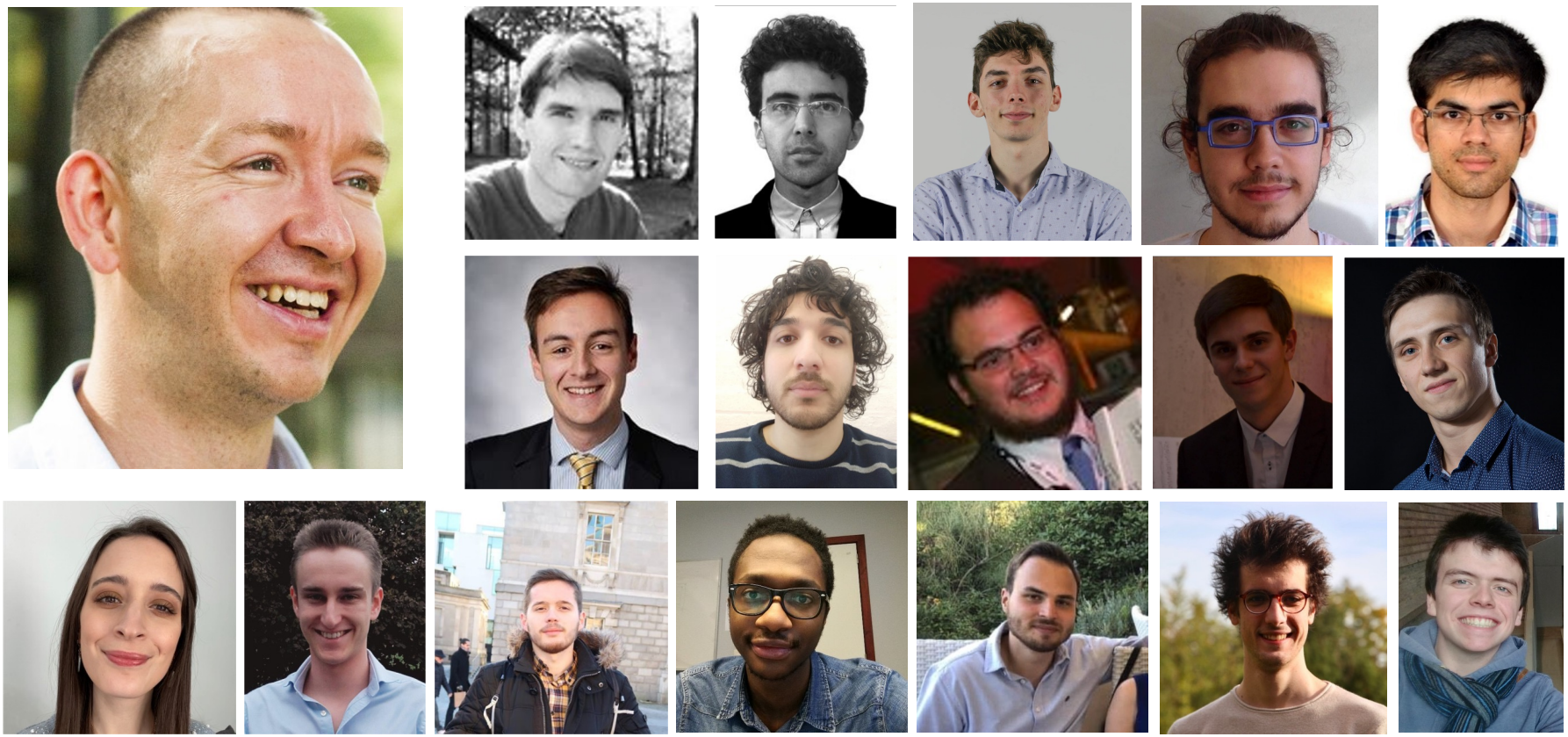
Menu for this lesson

- The Team
- The Goals
- The Rules

Montefiore Smart Grids Team

Research at the cross-road of energy and artificial intelligence

Montefiore Smart Grids Team

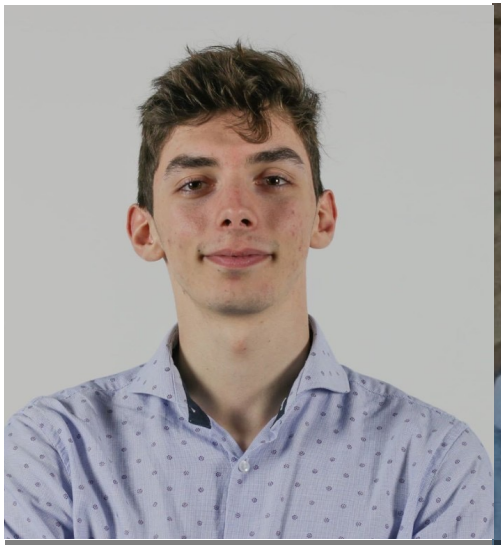


The Teacher

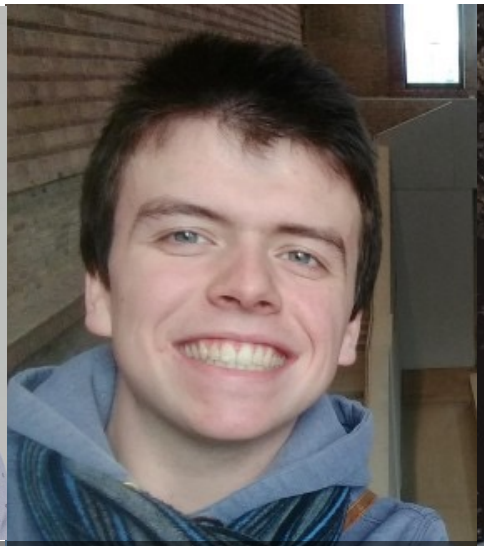
Damien Ernst

- Full professor
- Co-founder of Blacklight Analytics
- Chief Scientific Officer of Haulogy
- Expert in power systems and reinforcement learning
- Teaching classes on
  - Energy Markets
  - Sustainable Energy
  - Reinforcement learning
  - Power and energy systems

The TAs



Matthias Pirlet



Victor Dachet

Adrien Bolland

The Goals (among many others)

- Learn the structure of electricity markets and how it came to be, be able to identify the pros & cons of such a structure.
- Understand how to trade/buy/sell electricity.
- Understand the impact of current political decisions on the future price of electricity.
- Understand the economic links that exist between electricity and other energy carriers.
- Learn about oil markets, gas markets and CO2 markets!

The Rules

For this course to reach its full potential, your **active participation** is required

⇒ Mix of ex-cathedra lessons, live exercises, Q&A, report analysis, …

⇒ Ask questions and do not hesitate to try to answer.

⇒ **It is by trying that you will learn**.

Points will be attributed through:

- A project (only for university students)
- An oral exam

For the second session, all points will be attributed through an oral exam.

Schedule

Note: Gramme students do not have to work the project..

Date	Lessons	Exercises/Homework
21/09/23	Presentation of the class Contextualization Overview of markets	/
28/09/23	Visit at the retailer Total Energies	/
05/10/23	From monopolies to market	/
12/10/23	Electricity Markets in Practice Day-ahead market	Description of the project
19/10/23	Trading over the electricity network	Exercises 1
26/10/23	Network security	Exercises 2
02/11/23	Toussaint (no class)	/
09/11/23	Impact of transmission	Exercises 3
16/11/23	Fossil fuel markets Part I: Gaz Markets Part II: Oil Markets (no part dedicated to the coal market)	Exercises 4
23/11/23	Carbon markets Advanced platform for retailers	
30/11/23	Project Q&A	Project Q&A
07/12/23	Regulation of the energy sector	
14/12/23	Presentation of the projects	

Communications and questions

If you have any **question** regarding the content or organisation of the class:

1. Preferred option:

- Come discuss with us after the class

2. Mail:

- Send mails to: Matthias.Pirlet@uliege.be or dernst@uliege.be

3. Office:

- Please take an appointment if you want to come to the office to discuss with us.

Warning

You can help us improve this class!

Please do not hesitate to send us your feedbacks.

Sources

Reference books

1. [Kirschen] *Fundamentals of Power System Economics*, Daniel S.Kirschen, Goran Strbac, 2019.
2. [Biggar] *The Economics of Electricity Markets,* Darryl R. Biggar, Mohammad Reza Hesamzadeh, Wiley, 2014.
3. [Morales] *Integrating Renewables in Electricity Markets,* Juan M. Morales, Antonio J. Conejo, Henrik Madsen, Pierre Pinson, Marco Zugn, Springer, 2014.
4. [Meeus] *The Evolution of Electricity Markets in Europe*, Leonard Meeus, Edward Elgar, 2020.
5. [Hansen] *Transition(s) électrique(s)*, Jean-Pierre Hansen, Jacques Percebois, Odile Jacob, 2017.

Courses

1. [Pinson] *Renewables in Electricity Markets*, Pierre Pinson, DTU
   - http://pierrepinson.com/index.php/teaching/
2. [Dumas] Lectures on residential energy supplier and residential electricity pricing
   - https://github.com/jonathandumas/ELEC0018-1-energy-markets-retailers