

Advances in Energy Conversion Technologies

(Thursday 13:00, room 9)

Requirements

Participation in all meetings is mandatory.

Each student has to make an **oral presentation** and submit a **short paper**.

An **electronic copy and a printed copy** of the **completed project** need to be delivered to Waldemar Targański (wtargans(at)pg.gda.pl) **not later than December 1st, 2017**.

The project papers should each be maximum 1500 words long and include figures, diagrams etc. During the seminars, every student will have **15 to 20** minutes to present his/her work, followed by the discussion.

The final grade will be based on a written project and the quality of presentation.

In your papers and presentations include technical data, characteristics, diagrams and schemes.

Each drawing must be explained/discussed during the presentation.

If you would like any changes of topics or dates, let me know no later than October 12th.

Projects/presentations topics

Students	Topic	Date
	<i>Time for own work and consultations with the teacher.</i>	
Wyrzykowski Paweł	Centralized and decentralized electricity generation – technologies, infrastructure, economic and environmental considerations	26 X
Szulc Kamil	Large scale solar thermal applications or local, micro systems – applicable technologies advantages and disadvantages	26 X
Stawiarska-Lenart Aneta	Combined Heat and Power (cogeneration) applications according to the EU policy and current status of member states and Poland	26 X
Kowalicka Daria	Trigeneration – combined heat, cool and power generation	9 XI
Kądziela Karolina	Bio-energy options – available fuels, conversion technologies and applications	9 XI
Jabłczyński Filip	New propulsion systems for vehicles - fuel cells, solar power, hybrid, biofuels	9 XI
Domagała Agnieszka	Stationary fuel cell applications – types of cells, necessary infrastructure, economic and environmental considerations, examples	16 XI
Deng Yinyou	Mobile fuel cell applications – types of cells, necessary infrastructure, economic and environmental considerations, examples	16 XI
Nowak Dawid	Advances in the nuclear energy applications	16 XI
Łozińska Natalia	CO ₂ storage as a mitigation method to reduce Greenhouse Gases emissions from large-scale power generation	30 XI
Łoziński Jakub	Emission reduction technologies and developments for fossil fuel-based power generation (NO _x , SO _x , particulates)	30 XI

Projects/presentations topics

1. Climate change – mitigate or adapt?
2. Emission reduction technologies and developments for fossil fuel-based power generation (NO_x, SO_x, particulates).
3. CO₂ storage as a mitigation method to reduce Greenhouse Gases emissions from large-scale power generation.
4. New propulsion systems for vehicles - fuel cells, solar power, hybrid, biofuels.
5. Stationary fuel cell applications – types of cells, necessary infrastructure, economic and environmental considerations, examples.
6. Ecolabels and eco-certificates as tools for promotion of clean energy and energy-efficiency.
7. Bio-energy options – available fuels, conversion technologies and applications.
8. Centralized and decentralized electricity generation – technologies, infrastructure, economic and environmental considerations.
9. Large scale solar thermal applications or local, micro systems – applicable technologies advantages and disadvantages.
10. Combined Heat and Power (cogeneration) applications according to the EU policy and current status of member states and Poland.
11. Mobile fuel cell applications – types of cells, necessary infrastructure, economic and environmental considerations, examples.
12. Wave and tidal power – theoretical background, commercially available technologies and existing plants.
13. Advances in the nuclear energy applications.
14. Nuclear waste management.
15. Strategies for promoting the efficient use of energy – examples from Western Europe.
16. The Long Emergency – what are the options of the current civilisation when the oil runs out?
17. Energy in tourism – transport, accommodations, activities.
18. New/future developments in the wind power – stratospheric wind turbines.
19. Carbon offsets and carbon calculators, background, comparison of the online calculators.
20. The concept of individual carbon budgets.
21. CO₂ sequestration as a mitigation method to reduce Greenhouse Gases emissions from large-scale power generation.
22. Directions and financing of energy R&D in the EU, the US and in Poland (what does it tell about the beliefs of the governments of the future energy “production”?)
23. The impact of the greenhouse gases emission trading within the EU on the development of new energy conversion technologies.
24. Market deregulation – successes and failures based on existing examples.
25. The hydrogen society – technological and infrastructural requirements, social, economic and environmental considerations (Iceland’s approach).
26. Solar cooling – technology, current status, possible applications.
27. Ocean Thermal Energy Conversion – a new solution to low temperature cooling (case study of plant in Hawaii).
28. Trigeneneration – combined heat, cool and power generation.
29. Refrigerants – types, environmental impact, legislation, new fluids.
30. Modern engines – types, properties, problems and solutions.
31. Modern refrigerating systems and heat pumps – types, problems and solutions.
32. Your own topic (discussed with course co-ordinator) – **I invite You to develop Your own topic!!!!**

Contact with the teacher:

Waldemar Targański, PhD.

Room: 9 LM

E-mail: wtargans(at)pg.gda.pl