

Course Staff

Course Convenor: Dr Anna Bruce, TETB 318, a.bruce@unsw.edu.au

Tutors: Katelyn Purnell k.purnell@student.unsw.edu.au

Naomi Stringer n.stringer@unsw.edu.au

David Richardson david.richardson@unsw.edu.au

Consultations: For all course administration enquiries, contact the course convenor. For content-related questions, you are encouraged to ask questions during class or via the Moodle discussion.

Staying Informed: Moodle will be used to disseminate course material and announcements. Students are expected to monitor their UNSW email account and take careful note of all announcements.

Course Details

Credits

This is a 6 UoC course and the expected workload is 13–14 hours per week throughout the 10 week term.

Relationship to Other Courses

This interdisciplinary course is a core course for Renewable Energy Engineering undergraduate students, and an elective for Photovoltaics undergraduate students and UNSW postgraduate students from a range of disciplines.

Pre-requisites and Assumed Knowledge

Students should have a basic understanding of renewable energy technologies and their applications.

Context and Aims

We live in a time of energy transition. What are the implications of technological change and a clean energy future? Will our energy future be centralised or distributed? What is the role of the smart grid? Which technologies and business models might emerge and what are the policy and regulatory factors that affect their viability?

In this course, we review objectives and strategies of renewable energy policy. We develop an understanding of the renewable energy industry, markets, and the policy and economics context. We examine how technologies and industries evolve and how stakeholders and institutions interact in the energy industry. We develop frameworks and skills to access and analyse market and industry data, and use these to assess the impacts of policy and regulatory change and the emergence of new technologies and business models.

Selection and design of policy instruments, including regulation, taxation, tariffs, targets, incentives

and market-based schemes will be explored. Specific policy and regulatory approaches, the views of different stakeholders and interaction with the broader policy regulatory environment will be examined for specific policy case studies.

Lectures will be used to introduce policy and economic concepts, current status and issues for sustainable energy transitions, analysis frameworks and tools, and to describe a range of policy instruments and their application. Examples of policy approaches will be used to illustrate concepts and to provide context.

Tutorials are designed to engage students with the course material and current developments in domestic and international renewable energy policy. Student-led discussion on the week's topic and participation in discussion will allow students to expand their knowledge of the subject, engage with alternative views and improve their critical thinking.

Within the course, students are encouraged to actively participate in order to maximize their own learning.

Learning Outcomes

After successful completion of this course, you should be able to:

1. Describe the context and drivers for renewable energy policy, with a focus on the different roles of markets and governments.
2. Describe the structure, operation and stakeholders in the Australian renewable energy industry and energy markets.
3. Apply economics and policy concepts and frameworks to identify market failures and barriers to renewable and distributed energy deployment and integration in energy markets.
4. Access market and industry data and analyse renewable energy business models and the impacts of market regulatory arrangements and policy instruments.
5. Critically evaluate renewable energy and climate policy effectiveness, efficiency, equity and feasibility, and propose policy and market reform.

This course is designed to achieve the above learning outcomes which address the specific UNSW and Faculty of Engineering graduate capabilities listed in **Appendix A**. This course also addresses the Engineers Australia (National Accreditation Body) Stage I competency standard as outlined in **Appendix B**.

Contact Hours

This course comprises four hours of formal contact per week:

| | | |
|---------------------------------------|-------------------|----------------------------|
| Lecture: | Mon 10-13* | TETB LG07 |
| Tutorial | | |
| (except wk 7 and public hols): | Wed 12-14 | Business School 205 |
| | Wed 14-16 | Business School 219 |
| | Thu 12-14* | Business School 130 |

Week 7 Tutorial: Schedule a time with your tutor for assignment feedback

***Classes missed due to Public holidays on Monday 22nd April and Thursday 25th April (week 10) will be made up during week 11**

Syllabus

Tutorials will follow one of two formats:

1. Student led discussion and/or activities related to the current topic.

Groups, each of around 6 students, will be formed in the first tutorial. For the tutorial topics numbered in the course schedule below (2, 4, 5, 6, 8, 9 and 10), groups will be allocated tutorial preparation and facilitation tasks. Each group will be given a mark at the end of the semester for tutorial participation.

Guidance and assessment criteria will be provided on facilitating the tutorial. Groups are encouraged to consult their tutor for support or feedback in relation to their preparation. The UNSW Learning Centre also provides advice to students on participating in tutorial discussions.

2. Support for assignment

Prior to the week 3 tutorial, students submit their assignment proposal online, for discussion during the tutorial. During week 7, students will present part 1 of their assignment work for feedback from their tutor. The assignment is staged and feedback is provided to support student learning and skills development and improvement of the quality the final submissions.

Indicative Class Schedule

The course is arranged in 4 modules, as shown in the schedule below.

| |
|--|
| Module 1 - Introduction to Government, Public Policy, and Energy Governance in Australia |
| Module 2 - Renewable Energy Industry, Investment and Policy |
| Module 3 - Electricity Industry Regulation and RE Integration |
| Module 4 - Climate Policy |

| Wk | Lecture | | Tutorial |
|-------|---------|---|--|
| 1 | 18-Feb | 1. Course Intro. Renewable Energy Policy Context | Admin + Debate: free market vs govt |
| 2 | 25-Feb | 2. Markets and Government, Policy Processes and Energy Governance | 2. Market and Government Failures |
| 3 | 4-Mar | 3. RE Policy across the Technology Lifecycle | Assignment Prep - Energy policy landscape mapping |
| 4 | 11-Mar | 4. RE Deployment Policies | 4. The RET and the alternatives |
| 5 | 18-Mar | 5. Tariffs for Electricity and Renewable Energy | 5. Tariffs in a post-FiT world |
| 6 | 25-Mar | 6. Electricity Markets and RE Integration | 6. Renewable energy transitions and integration in electricity markets |
| 7 | 1-Apr | 7. Network Planning, Regulation and RE | Assignment individual feedback |
| 8 | 8-Apr | 8. Distributed Energy and Retail Markets | 8. New business models |
| 9 | 15-Apr | 9. GHG Emissions Policy | 9. Australian Emissions Policy |
| 10/11 | 29-Apr | 10. International Climate Change Agreements (week 11)* | 10. Climate Role-Play: International Agreements (week 10 or 11)* |

*Classes missed due to Public holidays on Monday 22nd April and Thursday 25th April (week 10) will be made up during week 11

Attendance

Lecture slides do not contain sufficient detail to complete the assessment tasks and prepare for the exam, while tutorials often cover different material to that covered in lectures. It is therefore recommended that you aim to attend 100% of lectures and tutorials and take notes where appropriate. You must attend all tutorial classes. If, for any reason you cannot attend class, you must contact the course convenor and notify your group in advance.

Assessment

Assessment Rationale

Preparation for and facilitation of tutorial discussions will encourage students to actively engage in the course throughout the semester. Written assignments will require students to collect information about energy policies and regulations, their context, application and detailed design; to use modelling, analysis and frameworks to evaluate policy effectiveness, efficiency and impact on different stakeholder groups.

Assessment Tasks

Assessment consists of tutorial facilitation, lecture participation, a written assignment (with intermediate assessment and feedback stages), and a final examination paper. The exam is a 2 hour written examination, which tests understanding of the concepts introduced in the course and their application to policy analysis. Questions may be drawn from any aspect of the course, unless specifically indicated otherwise by the lecturer.

Assessment weightings are as follows:

| Task | % | Due |
|-----------------------|-----|--|
| Tutorial Facilitation | 20% | weeks 2-10 |
| Assignment | 40% | Final report due 1 st May with intermediate assessments |
| Final Exam | 40% | TBA |

You may feel that the time required to complete the Tutorial and Assignment exercises is disproportionately large compared to their weighting in the assessment table. However, you should see these as formative assessment and note that performing well in the final exam will rely on knowledge and skills developed in tutorials and assignments.

- Assignments will be submitted to Turnitin plagiarism detection software, and plagiarism will be penalised.
- Late assignments will be penalised 5% plus 5% per day that the work is late, to a maximum penalty of 50%, unless acceptable reasons are given.
- Adequate explanation will need to be provided for missed tutorials otherwise a mark of zero will be recorded for tutorial facilitation in that week. Students who arrive very late or leave the tutorial before the end of class without explanation will also receive a mark of zero.
- Details of assignment and tutorial facilitation tasks will be provided via Moodle.
- All material presented during the session, including guest lectures and tutorial discussion materials, may be examinable.

Relationship of Assessment Methods to Learning Outcomes

| | Learning Outcomes | | | | |
|-----------------------|-------------------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Tutorial Facilitation | ✓ | ✓ | ✓ | ✓ | |
| Assignment | | ✓ | ✓ | ✓ | ✓ |
| Final Exam | ✓ | | ✓ | | ✓ |

Course Resources

There is no text book for this course, however, topic specific resources will be available via Moodle. In addition to government resources, consultant and NGO reports will often be useful for this course. Energy Policy is the most relevant academic journal, and relevant articles also appear in other more technology-focused journals such as Sustainable and Renewable Energy Reviews, Renewable Energy, Applied Energy, Progress in Photovoltaics, Wind Energy, Solar Energy etc.

Keeping up to date RE policy-related media, reports and events.

During lectures and tutorials, material will be linked to current media and issues as appropriate. Students should subscribe to the ReNew Economy e-newsletter in order to keep abreast of the issues and understand the relevance of the course material (it is not necessary to read all of the articles, only those that are of most interest).

Other Matters

Academic Honesty and Plagiarism

Plagiarism is the unacknowledged use of other people's work, including the copying of assignment works and laboratory results from other students. Plagiarism is considered a form of academic misconduct, and the University has very strict rules that include some severe penalties. For UNSW policies, penalties and information to help you avoid plagiarism, see <https://student.unsw.edu.au/plagiarism>. To find out if you understand plagiarism correctly, try this short quiz: <https://student.unsw.edu.au/plagiarism-quiz>. Careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. You should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

Student Responsibilities and Conduct

Students are expected to be familiar with and adhere to all UNSW policies (see <https://student.unsw.edu.au/guide>), and particular attention is drawn to the following:

Workload

It is expected that you will spend at least **13 to 14 hours per week** studying a 6 UoC course, from Week 1 until the final assessment, including both face-to-face classes and *independent, self-directed study*. In periods where you need to need to complete assignments or prepare for examinations, the workload may be greater. Over-commitment has been a common source of failure for many students. You should take the required workload into account when planning how to balance study with employment and other activities.

Attendance

Regular and punctual attendance at all classes is expected. UNSW regulations state that if students attend less than 80% of scheduled classes they may be refused final assessment.

General Conduct and Behaviour

Consideration and respect for the needs of your fellow students and teaching staff is an expectation. Conduct that unduly disrupts or interferes with a class is not acceptable and students may be asked to leave the class.

Work Health and Safety

UNSW policy requires each person to work safely and responsibly, in order to avoid personal injury and to protect the safety of others.

Special Consideration and Supplementary Examinations

You must submit all assignments and attend all examinations scheduled for your course. You should seek assistance early if you suffer illness or misadventure which affects your course progress. All applications for special consideration must be **lodged online through myUNSW within 3 working days of the assessment**, not to course or school staff. For more detail, consult <https://student.unsw.edu.au/special-consideration>.

Continual Course Improvement

This course is under constant revision in order to improve the learning outcomes for all students. Please forward any feedback (positive or negative) on the course to the course convener or via the Course and Teaching Evaluation and Improvement Process. You can also provide feedback to RESOC who will raise your concerns at student focus group meetings. As a result of previous feedback obtained for this course and in our efforts to provide a rich and meaningful learning experience, we have continued to evaluate and modify our delivery and assessment methods.

Following the successful transition of this course to a project-based course two years ago,

Administrative Matters

On issues and procedures regarding such matters as special needs, equity and diversity, occupational health and safety, enrolment, rights, and general expectations of students, please refer to the UNSW policies:

<https://my.unsw.edu.au/student/atoz/ABC.html>

Appendix A: UNSW Graduate Capabilities

The course delivery methods and course content directly or indirectly addresses a number of core UNSW graduate capabilities, as follows:

- **Scholars** capable of independent and collaborative enquiry, rigorous in their analysis, critique and reflection, and able to innovate by applying their knowledge and skills to the solution of novel as well as routine problems;
- **Entrepreneurial leaders** capable of initiating and embracing innovation and change, as well as engaging and enabling others to contribute to change;
- **Professionals** capable of ethical, self- directed practice and independent lifelong learning;
- **Global citizens** who are culturally adept and capable of respecting diversity and acting in a socially just and responsible way.

Appendix B: Engineers Australia (EA) Professional Engineer Competency Standard

| | Program Intended Learning Outcomes | | LOs to develop competency |
|---|---|---|---------------------------|
| PE1: Knowledge and Skill Base | PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals | ✓ | 2, 3 |
| | PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing | | |
| | PE1.3 In-depth understanding of specialist bodies of knowledge | ✓ | 4, 5, 6, 7 |
| | PE1.4 Discernment of knowledge development and research directions | ✓ | 3, 4 |
| | PE1.5 Knowledge of engineering design practice | | |
| | PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice | ✓ | 1 |
| PE2: Engineering Application Ability | PE2.1 Application of established engineering methods to complex problem solving | | |
| | PE2.2 Fluent application of engineering techniques, tools and resources | | |
| | PE2.3 Application of systematic engineering synthesis and design processes | | |
| | PE2.4 Application of systematic approaches to the conduct and management of engineering projects | | |
| PE3: Professional and Personal Attributes | PE3.1 Ethical conduct and professional accountability | ✓ | 1 |
| | PE3.2 Effective oral and written communication (professional and lay domains) | ✓ | 5, 6, 7 |
| | PE3.3 Creative, innovative and pro-active demeanour | ✓ | 5, 6, 7 |
| | PE3.4 Professional use and management of information | ✓ | 5, 6, 7 |
| | PE3.5 Orderly management of self, and professional conduct | | |
| | PE3.6 Effective team membership and team leadership | ✓ | 5, 6, 7 |