



**UNIVERSITY
OF ALBERTA**

ECON 366: Energy Economics

Topic 1: An Introduction to Energy Economics

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Welcome!

Some quick facts about me:

- I grew up in Ottawa
- I have degrees in environmental science, economics, and law
- My academic interests are energy economics, environmental policy, constitutional law, and energy markets
- I've worked in various governmental advisory roles
- This is my fourth time teaching this class.
I also taught energy markets in the School of Business for 10+ years



Welcome!

Beyond the classroom:

- I have two kids, aged 15 and 16
- I have a border collie named Kona
- My main hobby is cycling, and I also play hockey and dabble in woodworking
- I have a serious Twitter addiction

My expectations of you

Your expectations of me



About this course: learning goals

By the end of this course, you will:

1. be familiar with the major sectors of Alberta's energy economy;
2. understand the key local and global drivers for energy supply and demand;
3. be able to relate popular press discourse about energy economics to basic economic models;
4. understand the implications of climate change policies for the global and local energy economy;
5. be able to access, present, and interpret relevant energy and economic data;




Class delivery

- Regular MW class meetings will be in person unless circumstances force us online; I will not teach in person if I am putting you at risk
- Friday classes will be an asynchronous class which I will use for R lessons, data exercise reviews, and other similar material to let you work through the data work at your own pace
- I do not plan to record or stream class content for in-person meetings, although I may make exceptions on a case-by-case basis (pre-midterm and pre-final classes, for example)

Materials

- Canvas and my personal class website
- slides and data exercises
- practice questions
- podcasts and other media
- data and other resources
- pre-exam practice problems
- there is no textbook

Communication

- Canvas announcements
- Email me:  aleach@ualberta.ca
- Code and data help:  leachandrew or my projects page
- My Twitter:  @andrew_leach
- Class discussion and lecture materials
- Periodic energy charts Substack

Assignments

Task	Date	Weight
Data assignments	online, one per month	30%
Midterm	In class, February 12th	25%
Final	TBD	45%

Tips for Success

- Attend class;
- Take notes;
- Do any data exercises and problem sets;
- Work together;
- Ask questions, participate, and drop by during my office hours;
- Read the Energy Charts weekly and other sources I provide to you;
- Don't struggle in silence, you are not alone!

Roadmap for the Semester (1/3)

Introduction

Concepts: RMarkdown; Quarto; Data sources(e.g. EIA; CER; AER; AESO; CANSIM; ECCC; IEA; BP)

The Global Energy Economy

Concepts: Total primary energy supply; supply; demand; electricity generation vs. capacity; climate change.

Roadmap for the Semester (2/3)

Oil and gas markets

Concepts: OPEC; WTI; Brent; AECO/NIT; Henry Hub; fractionation; backwardation; contango; storage; inventories; sweet vs. sour crude or gas; well-head prices; pipeline gas.

Oil and gas production, reserves, resources

Concepts: conventional vs. unconventional extraction; shale gas; light tight oil; fracking; *in situ* vs. mined oil sands; type curves; 1P and 2P reserves; company-level vs. country-level reserves; capital vs. operating costs; supply cost and net present value of an oil project.

Roadmap for the Semester (3/3)

Pipelines and Downstream Processing

Concepts: tolls; common carrier; open season; diluent recovery unit; *Canadian Energy Regulator Act*; cost-of-service regulation.

Electricity

Concepts: duration curves; cost-of-service; merit order; ancillary services; energy storage; prices and riders; rate regulation; electrification.

GHG Policy

Concepts: marginal abatement cost; marginal damage; carbon budgets; POGG; tax; output-based allocation; GHG; Kyoto; Copenhagen; Glasgow; IPCC; UNFCCC; COP.

A reminder on positive and normative statements

- Economics alone can't tell you the **right** decision
- A positive statement is a statement of what **is** or what **will happen** and describes reality.
 - If you increase the costs of production, consumer prices will go up.
- Positive statements can reflect **uncertainty** about outcomes
- A normative statement concerns what somebody believes **should** happen:
 - “The government should tax greenhouse gas emissions.”
 - Normative statements cannot be tested because they imply value judgments which cannot be refuted by evidence.
- Normative statements can inform objective functions
 - A decision-maker might value a policy which does not increase inequality
 - Economists can provide constrained advice: this policy accomplishes your objective and *is unlikely to* increase inequality