**SSC2030 End-of-semester survey: Transforming our energy system**

**This, and our meeting during finals week, is your final assignment for the course. Please complete and submit the survey by Monday midnight so that I can compile the results for our meeting. Either:**

* **Complete it in Word and email it to me; or**
* **Print it, fill it in by hand, scan it and email it to me.**

**And, as always, contact me if you have questions or concerns.**

**Terminology & perception**

1. Which term do you feel best represents our goals? *(choose one)*

* *Sustainable energy* **5**
* *Renewable energy*
* *Clean energy* **2**
* *Clean & secure energy*
* *Low-carbon energy*

2. Which term would appeal to the greatest number of Americans or could win over the most Americans? *(choose one)*

* *Sustainable energy* **0**
* *Renewable energy* **1**
* *Clean energy* **2**
* *Clean & secure energy* **3**
* *Low-carbon energy* **1**

**What do you know about energy in the US & Vermont**

*[Please answer these questions* ***without*** *searching the internet!]*

3. Is overall energy production increasing in the US? *(choose one)*

* *yes* **6**
* *no* **1**

4. Is fossil fuel energy production increasing the US? *(choose one)*

* *yes* **7**
* *no* **0**

5. Is renewable energy production increasing in the US? *(choose one)*

* *yes* **7**
* *no* **0**

6. Is overall energy consumption increasing in the US?

* *yes* **7**
* *no* **0**

7. Rank type of energy from most rapidly (\*\*\*\*\*) to most slowly (\*) increasing:

* Coal -1.3 quad, 2015 - 2016
* Oil +0.3 quad “
* NG +0.3 quad “ **most = 4**
* Nuclear +0.1 quad “
* All renewables +0.7 quad “ **most = 3**

Between 1993 and 2011, **global energy intensity** (Btu per each dollar of GDP) fell 18.7%.

1. Where do you think the US ranks globally in terms of global energy intensity? 57th

**Most thought top 10-15**

1. Did US energy intensity increase or decrease from 1993 to 2011? Down 28.6%
* *increased* **6**
* *decreased* **1**

10. Is global climate change is real and happening now?

* *yes* **7**
* *no* **0**

11. Are emissions of greenhouse gases increasing or decreasing in the US?

* *increasing* **7**
* *decreasing* **0**

**Technology & policy:**

12. In your opinion, what should America’s top energy priorities be? *(Rank top 3: \*, \*\*, \*\*\*.)*

* Protecting the environment from the effects of energy development and use.
* ✔Increasing implementation and reliance on renewable energy.
* ✔ Creating jobs within the energy sector.
* Keeping energy prices low for consumers.
* ✔Increasing energy security & reducing dependence on foreign energy sources.

13. Which do you agree with more strongly: *(choose one)*

* *Regulations will be needed to move us towards a more sustainable energy system.* **6**
* *The free market will be ensure to move us to a more sustainable energy system.* **1**

14. Do you think our choice of primary energy resources and energy technologies are related to the amount of air and water pollution in America? *(choose one)*

* *yes* **5**
* *no* **1**
* *somewhat* **1**

15. Do you believe that it is possible to cut back on environmental regulations and still protect air and water quality? *(choose one)*

* *yes* **0**
* *no* **7**
* *somewhat* **0**

16. Which do you believe is a better approach to motivating change? *(choose one)*

* *Regulation & penalty (the stick)* **0**
* *Incentives (grants, tax credits, rebates; the carrot)* **0**
* *Some mixture of both* **7**

17. Do you support government investments / tax credits / incentives in energy efficiency?

* *yes* **7**
* *no* **0**

18. Do you support government investments / tax credits / incentives in renewable energy?

* *yes* **7**
* *no* **0**

19. Do you support mandatory limits on greenhouse gas emissions (carbon caps)? *(choose one)*

* *yes* **7**
* *no* **0**

20. Do you support a carbon tax? *(choose one)*

* *yes* **4**
* *no* **3**

A recent DOE proposal calls for power market operators to guarantee payment and price to power plants that keep 90 days of fuel on site.

21. Do you support this proposal? *(choose one)*

* *yes* **3**
* *no* **4**

22. When voting, do you consider candidates positions on energy and energy-related issues and policies? *(choose one)*

* *always* **3**
* *sometimes* **4**
* *never*

**Your use of renewable energy**

23. Do you (or anyone in your family) have any renewable energy at home? *(choose one)*

* *yes* **3**
* *no* **4**

24. If so, which represent your reasons for choosing to use renewable energy. *(Rank \* to \*\*\*\*.)*

* ✔To save money on utility bills
* ✔To help the environment
* ✔To benefit your family’s health
* To get a tax credit or rebate

25. If not, would you like to use renewable energy at home? *(choose one & explain)*

* yes**7**
* *no And please explain why not.* **0**

**Transforming our energy systems**

26. How quickly do you think we should change our energy system? *(choose one)*

* *immediately* **1**
* *as quickly as alternatives to fossil fuels can be deployed* **6**
* *only as quickly as existing energy sources are depleted*

27. Do you believe that we can power America without fossil fuels: *(choose one)*

* *within 25 years* **2**
* *within 50 years* **1**
* *within 75 years* **2**
* *within 100 years* **2**
* *no* **0**

28. Do you think we could power America using only renewable energy 100 years from now?

* *yes* **5**
* *no* **2**

29. Do you support Vermont’s goal of 90% renewable energy by 2050? *(choose one*)

* *yes* **1**
* *no* **0**
* *Yes, if I could make some changes or specify some things.* **6**

30. Which are the greatest obstacles to moving towards a more sustainable energy system.

*(Rank choices from low\* to high\*\*\*\*\*.)* **all over the map; little concensus**

* High cost / lack of low-interest loans
* Politics / lobbying
* Lack of information / education
* Inertia (change is hard & takes effort)
* Lack of technologically viable options

31. What single step do you think the federal government could take to increase the sustainability of America’s energy system?

Marketing

Focus on new technologies

Every home at least one RE

Nationalize oil companies

Lessons from countries that have had success

Divert (ff) subsidies to RE infrastructure

Recognize that we have a problem

32. What single step do you think Vermont’s government could take to increase the sustainability of America’s energy system?

New nuclear everywhere
Go totally RE
RE in every new structure / project
Increase storage & resiliency
Get out front & be an example for others
Don't know
Get real about the CEP w/ detailed plans & timelines

**Modeling and accomplishing an energy transition**

**Stabilization wedge approach** [I’ve posted your compiled wedge plans on this web page.]

33. Did you find that the stabilization wedge model made it easier to begin thinking about energy system transition, and did it make transition seem more possible? *(choose one)*

* *yes* **7**
* *no* **0**

34. What approaches or strategies would you **add** as wedge choices?

Efficient storage (x2)

Nuclear

Efficient transportation

Offshore and wave energy

All existing technologies (bring it up to date)

Nothing needed

Don’t know

35. If you were in charge of implementing a stabilization wedge strategy to transform our energy system, would you allow local / state choice or would you implement a single federal strategy? *(choose one)*

* *local / state* **5**
* *single federal* **2**

36. What role would data and results play if you were in charge of implementing a stabilization wedge strategy?

Data is everything; monitor & use to improve the process

To look at regional success or failure

Data plays a huge role in wedge strategy

Shape public's belief about what works

Use aggregated data vs. individual data for privacy reasons

Data to assess & adjust for best success

To see if a plan is working

**Regional energy planning: Two-Rivers Ottauquechee Regional Commission (TRORC)**

Vermont has eleven regional planning commissions. Each is responsible for developing a regional energy plan with the state’s goal of 90% renewable energy by 2050. Regional plans set energy targets for each region’s member towns, and provide energy data and energy resource mapping for each town.

TRORC’s regional energy plan is the first to be approved and includes Randolph. *Please have a look at these posted summaries and map before answering the next set of questions. Note that these are posted on the same web page as this survey*.

* TRORC’s energy data & goals;
* My graphical representation of these energy goals; &
* Regional energy resource map, highlighting optimal locations for wind and solar.

37. Do you feel that the regional energy plan and targets are more specific and granular than Vermont’s goal of 90% renewable energy by 2050 and the ‘roadmap’ laid out by Vermont’s 2016 Comprehensive Energy Plan? *(choose one)*

* *yes* **7**
* *no* **0**

38. Do you think that the regional energy plan is sufficient to achieve its goals? *(choose one)*

* *yes* **3**
* *no* **4**

39. Do you see similarities between TRORC’s regional energy plan and the stabilization wedge strategy? Be sure to check my graphical representation of TRORC’s goals. *(choose one)*

* *yes* **7**
* *no* **0**

40. What are your **two** greatest criticisms of TRORC’s regional energy plan?

Move too electric vehicles is too fast; too expensive

NIMBY; high costs

Specify which RE goes where; Unrealistic

Start with current data; have specific locations & timelines

Over-reliance of solar; too short a time to reach 90%

Steps & timeline; information for users about energy systems

45. What **two** suggestions or changes would you make to TRORC’s energy plan?

Faster RE; faster conservation

More time to transition; set $/region funding

Allow wood heat; electric car not ideal for VT

Be realistic for low income; increase 3-phase service

Too reliant on wind; invest in biomass & methane

Add 15-20 years; more emphasis on wind

Where to get information?; how to get involved?

**ESSEX plan: a carbon tax plan with a twist**

In November 2017, a group of Vermonters including policy experts, advocates, business leaders, economists and lawmakers proposed the ESSEX plan to help Vermont transition to a more sustainable energy system. Briefly, ESSEX (an Economy Strengthening Strategic Energy Exchange) imposes a (carbon) tax on most fossil fuels and applies 100% of that revenue to lowering electric rates, so that the costs of fossil fuels slowly rises while the cost of electricity slowly falls at the same rate.

Of course, there is more to the plan (farm diesel is exempt, there is an additional incentive for rural Vermonters with more driving) but the idea is to combine carrot and stick to reduce fossil fuel use and replace it with electricity while increasing production of renewable electricity.

*I’ve posted links to the ESSEX plan and to an article about it on the web page where this survey is posted. To learn more, watch this five-minute VIDEO presentation (2nd video down):*

http://eanvt.org/the-essex-plan-an-economy-strengthening-strategic-energy-exchange/

42. Do you support or oppose the broad outlines of the ESSEX plan?

* *Yes* **3**
* *no* **0**
* *somewhat* **4**

43. How do you think this would affect Vermont’s electric generators and utilities?

Will need more RE

Wouldn't affect utilities

Tough transition

Will use peak loads, need storage

We'll need more electricity but cost will go down. Incentive for more RE?

Periods of flux during change

Same old same old

44. What is your biggest question, concern or objection to the ESSEX plan?

Why always a tax?

Are there problems?

Reception by Vermonters

What about wood heaters? Cost of switching from oil

Rural transportation needs more help

Timeline may be too ambitious

Funds should be put into RE funding