

Emerging Energy Technology

Update: SB220 Legislation
Denali Commission EETG



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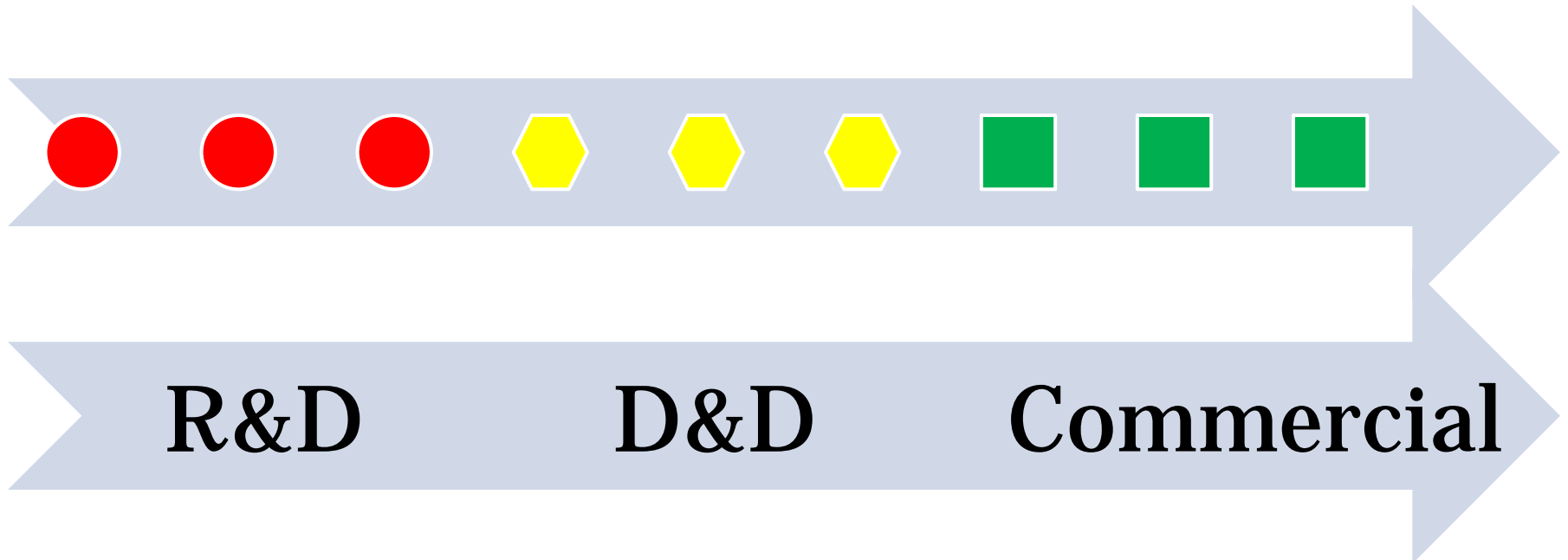
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What is
“emerging energy technology”?

Stages of Technology Development



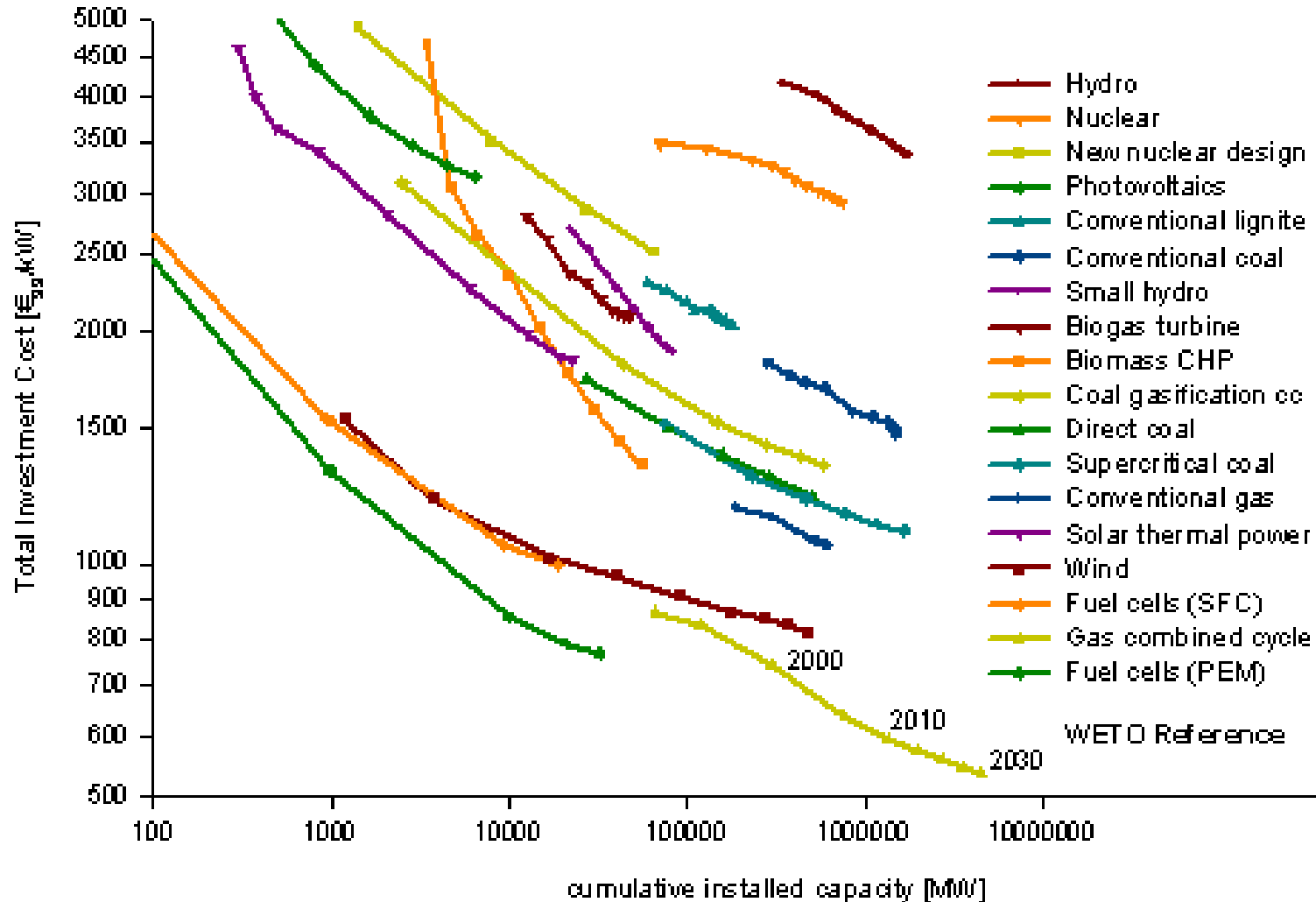
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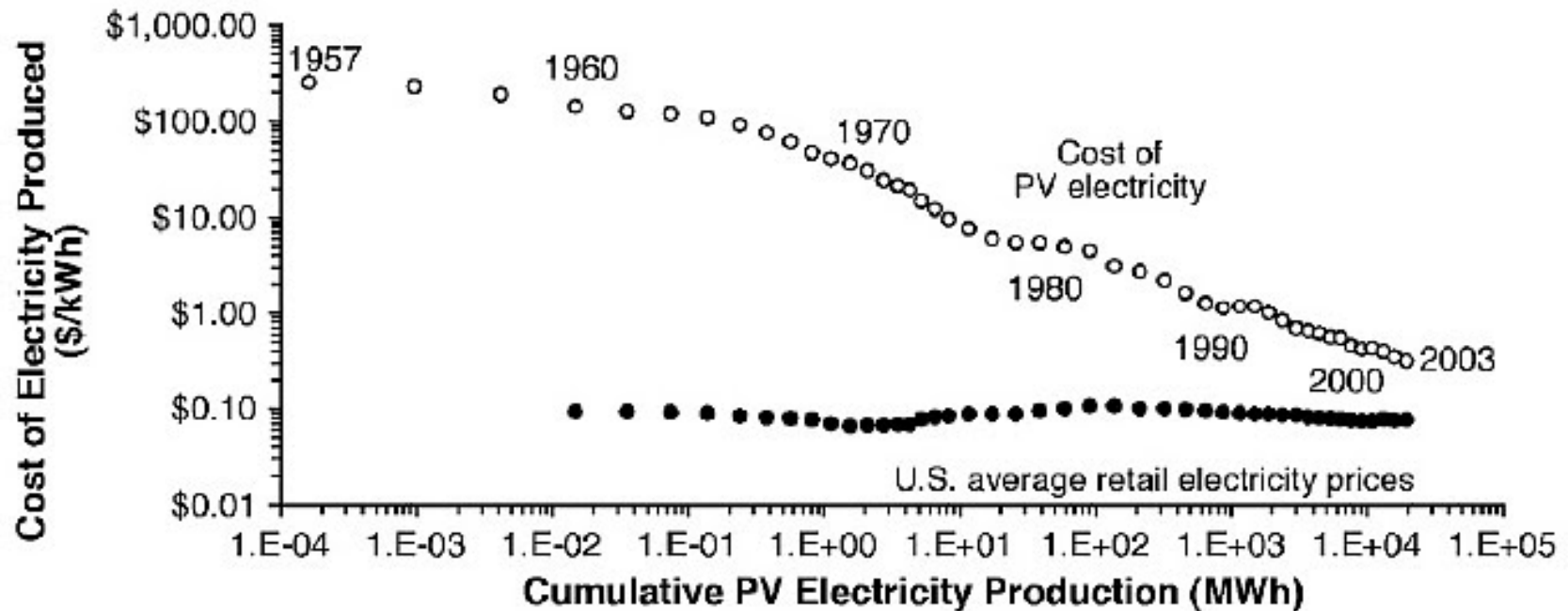
Learning curve for power generation technologies

(IPTS Energy, Transport and Climate Change Group)





Aggregate cost of electricity in the US, versus cost of PV electricity (<http://knol.google.com/k/solar-energy#>)





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Emerging
Energy
Technology



R&D

D&D

Commercial

Importance of energy innovation*



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- Reduce the costs of energy end-use forms to consumers
- Further reduce costs of energy services by increasing end-use efficiency
- Reduce dependence on oil in the USA and elsewhere
- Increase the reliability & resilience of energy systems against disruptions
- Minimize the environmental impacts of energy-resource exploration, extraction, and transport
- Increase the productivity of manufacturing
- Reduce the emissions of hazardous air pollutants
- Improve the safety and proliferation resistance of nuclear energy
- Slow the build-up of greenhouse gases
- Enhance the prospects for environmentally sustainable & politically stabilizing economic development



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“Innovation is the mechanism to get from energy status quo to desired energy future”

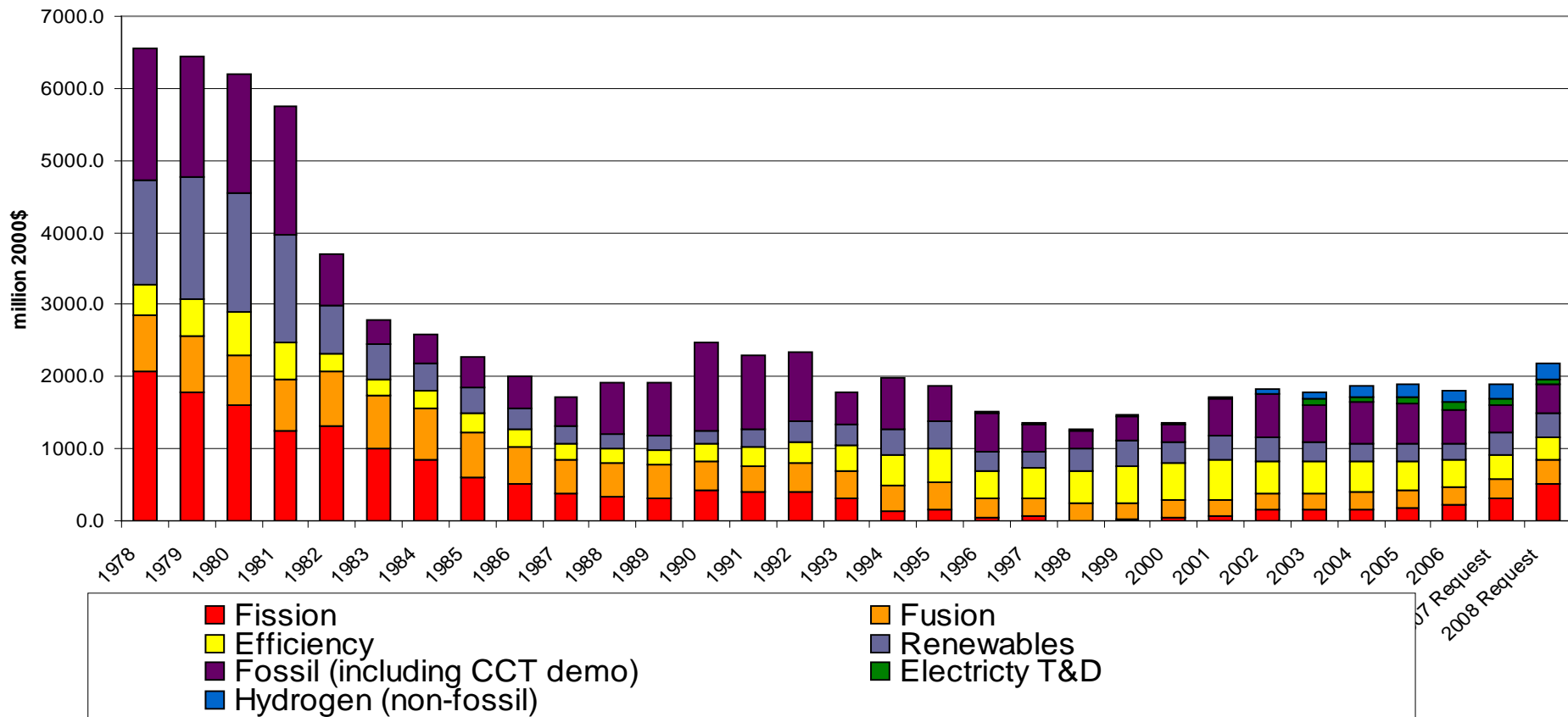


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“The core force of innovation -- vision, experimentation and wise investments -- has led to thousands of breakthroughs that benefit us all. A serious commitment to innovation can be transformative, as we saw with the effort to replace chlorofluorocarbons two decades ago. We need the same serious commitment in the energy sector to developing the original American energy supply: innovation.”



US DOE Energy RD&D Spending (Kelly Gallagher, Kennedy School of Gov't, 2-13-07)



Emerging Energy Technology Grant (EETG)



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- **Denali Commission, June 2008**
- **\$4mill available**
- **Eligibility**
 - **Alternative or renewable energy**
 - **Demonstration phase**
 - **Viable in 5 years**
 - **AK applicant**
 - **Potential for both widespread deployment in AK and reduced energy costs**

Why?



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- **Funding Gap**
- **Commercialization Hurdle**
- **Alaskan-specific energy challenges**

EETG: Results



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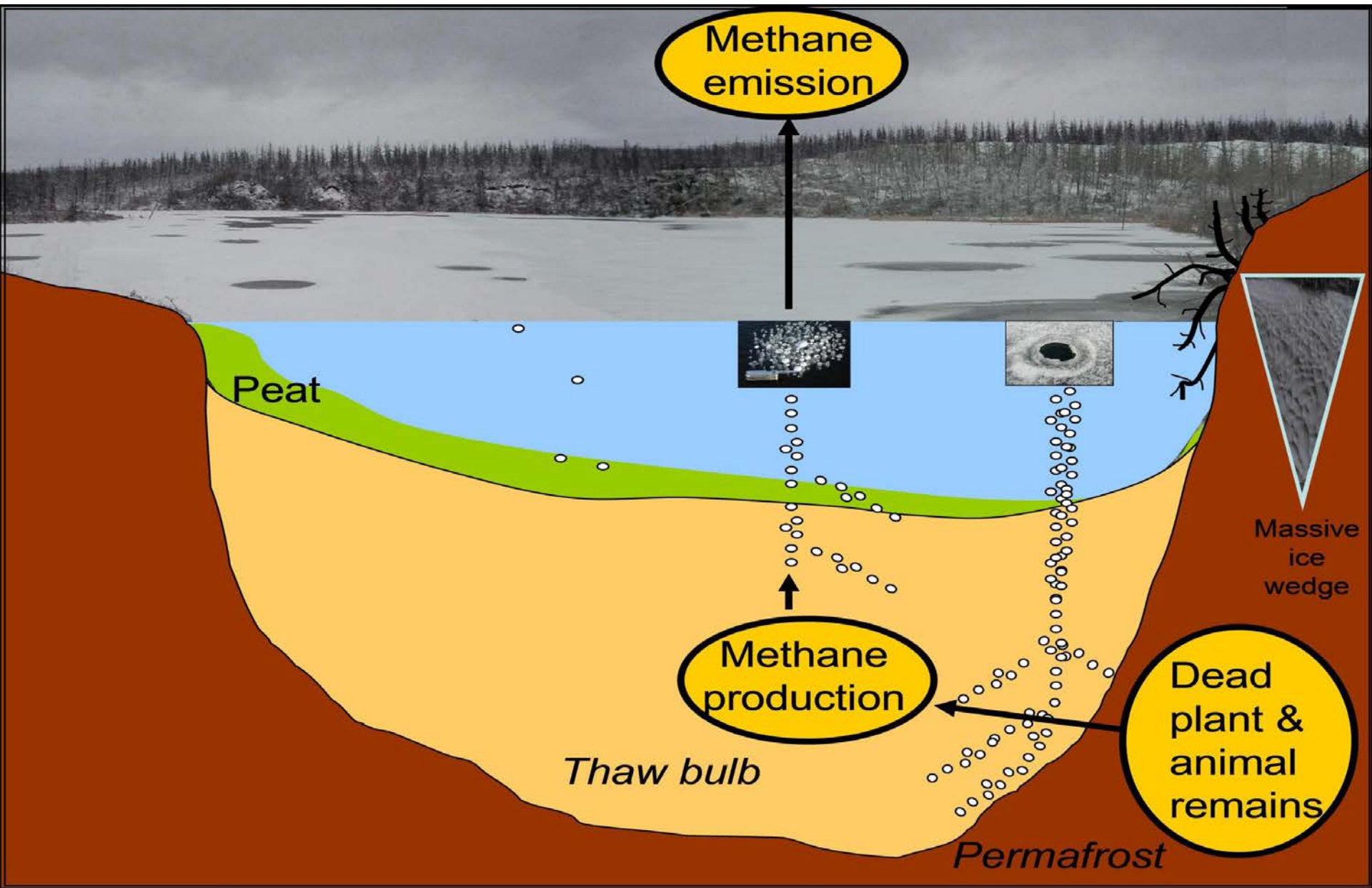
- 9 recipients out of 50 applications
- Academic entities, local governments, private investors, tribal groups, nonprofit organizations
- \$29.5 million in requests
 - Batteries and energy storage
 - Electric vehicles for rural areas
 - Hydrokinetic projects
 - Underground coal gasification
 - Seawater heat pumps
 - Controls, smart grids, and monitoring

EETG Recipients



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Alaska Sealife Center	Seawater Heat Pump Demonstration Project
Cordova Electric Cooperative	Psychrophiles for Generating Heating Gas
Kotzebue Electric Association	Feasibility of Solar Hot Water Systems
Kotzebue Electric Association	Flow Battery Energy Storage Systems
Kotzebue Electric Association	Wales Diesel-Off High Penetration Wind System
Ocean Renewable Power Company	Nenana Hydrokinetic Turbine
Sealaska Corporation	Commercial Scale Wood Pellet Fired Boiler
Tanana Chiefs Conference	Organic Rankine Cycle Heat Recovery System
University of Alaska Fairbanks	High Penetration Hybrid Power System





Lessons Learned



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“A critical element of funding emerging energy technology projects is the inclusion of a robust data collection and analysis component.”



Lessons Learned



Gov.

Public

Industry

Emerging Energy Technology Fund



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- **SB220, Sec. 42.45.375.**
- **Renewable/nonrenewable/efficiency**
- **\$2.4 million**
- **\$2.2 million Denali Commission match**

Questions?



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*"Energy-Technology Innovation" Lecture, John Holdren, April 24, 2007
Lawrence Berkeley National Laboratory's ELSI Project
<http://www.lbl.gov/Education/ELSI/research-main.html>
US Energy Information Administration
<http://www.eia.doe.gov/emeu/international/energyconsumption.html>
USDOE, EERE
http://apps1.eere.energy.gov/states/economic_indicators.cfm/state=AK