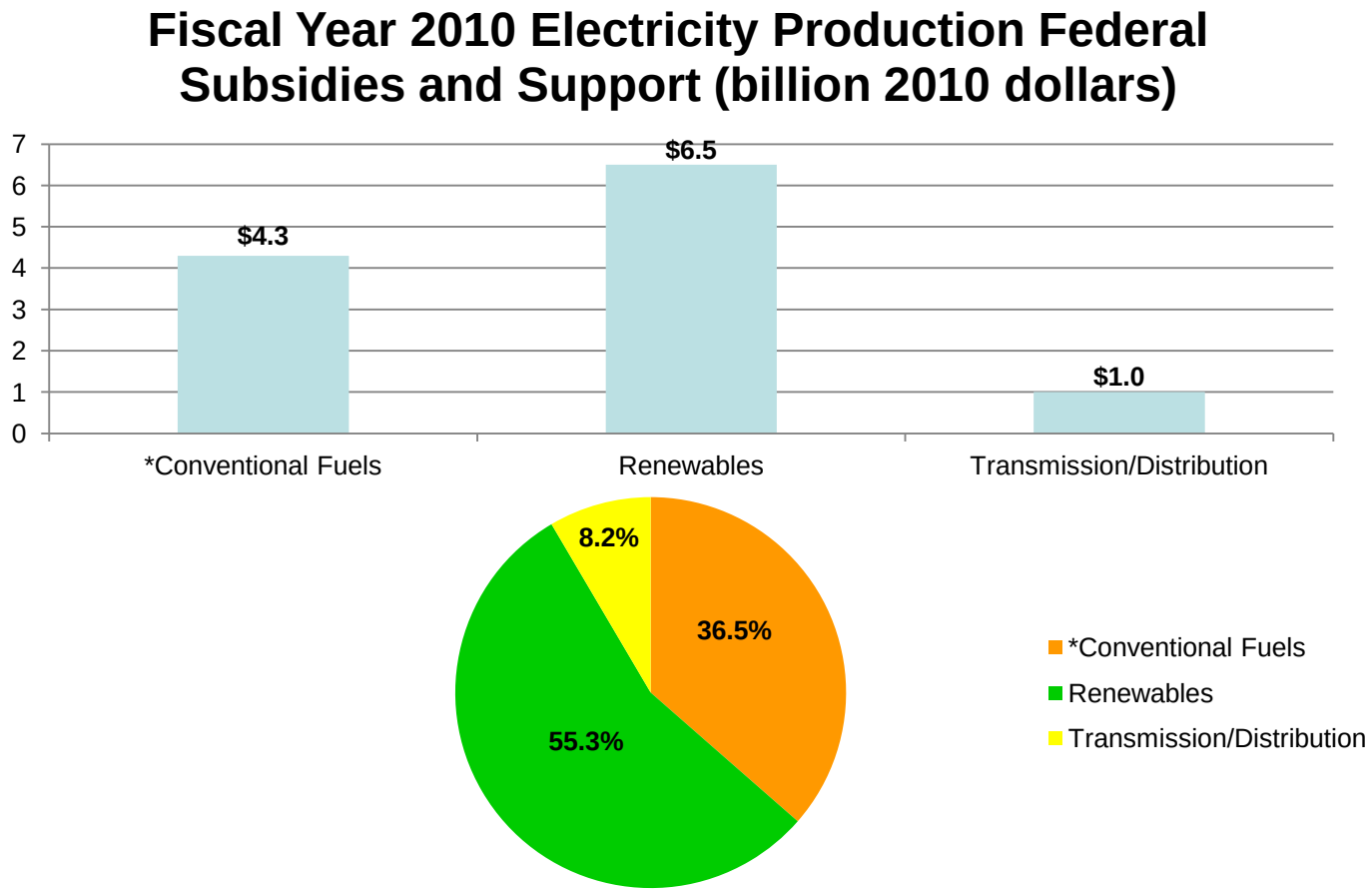
Comparing Federal Subsidies for Renewables and Other Sources of Electric Generation

Ann G. Berwick
Massachusetts Department of Public Utilities

Massachusetts Solar Summit 2012
June 13, 2012

Direct Federal Subsidies – Recent Snapshot



*** Natural Gas and Petroleum Liquids, Coal, Nuclear.**

Source: U.S. Energy Information Administration (EIA), July 2011.

Subsidies in Context

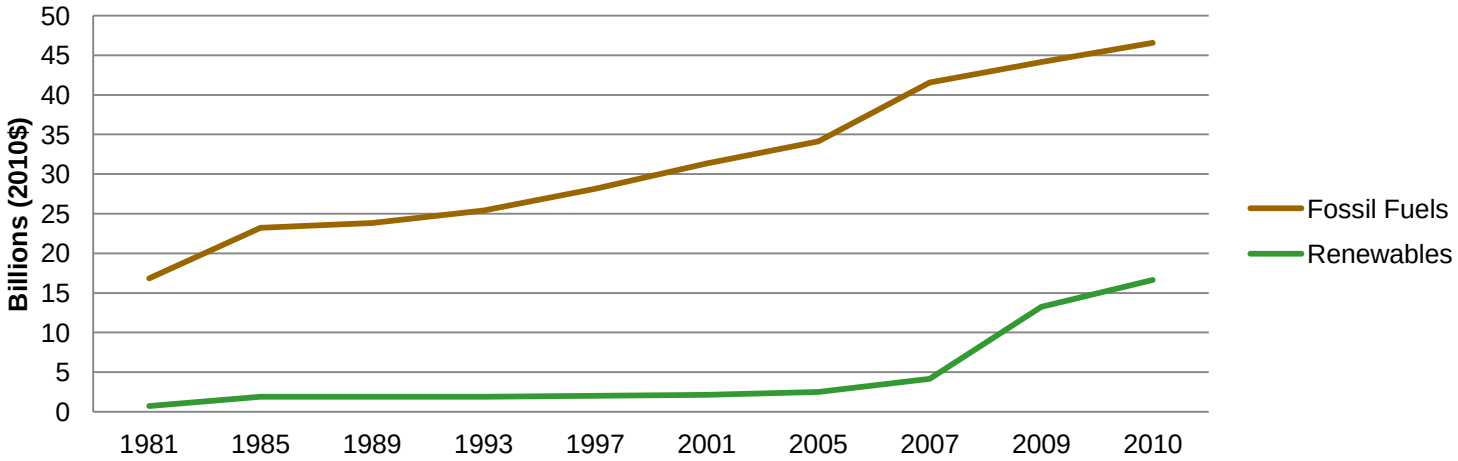
- From a historical perspective, government support for conventional generation resources has dwarfed support for renewables.
- The types of subsidies that exist for conventional resources are of higher value than the nominal value of the predominant subsidies for renewables.
- The external costs that conventional resources are not required to internalize are high.

Direct Federal Subsidies – Over Time

Tax Expenditures for Fossil Fuels and Renewables (2010 Dollars, Billions)

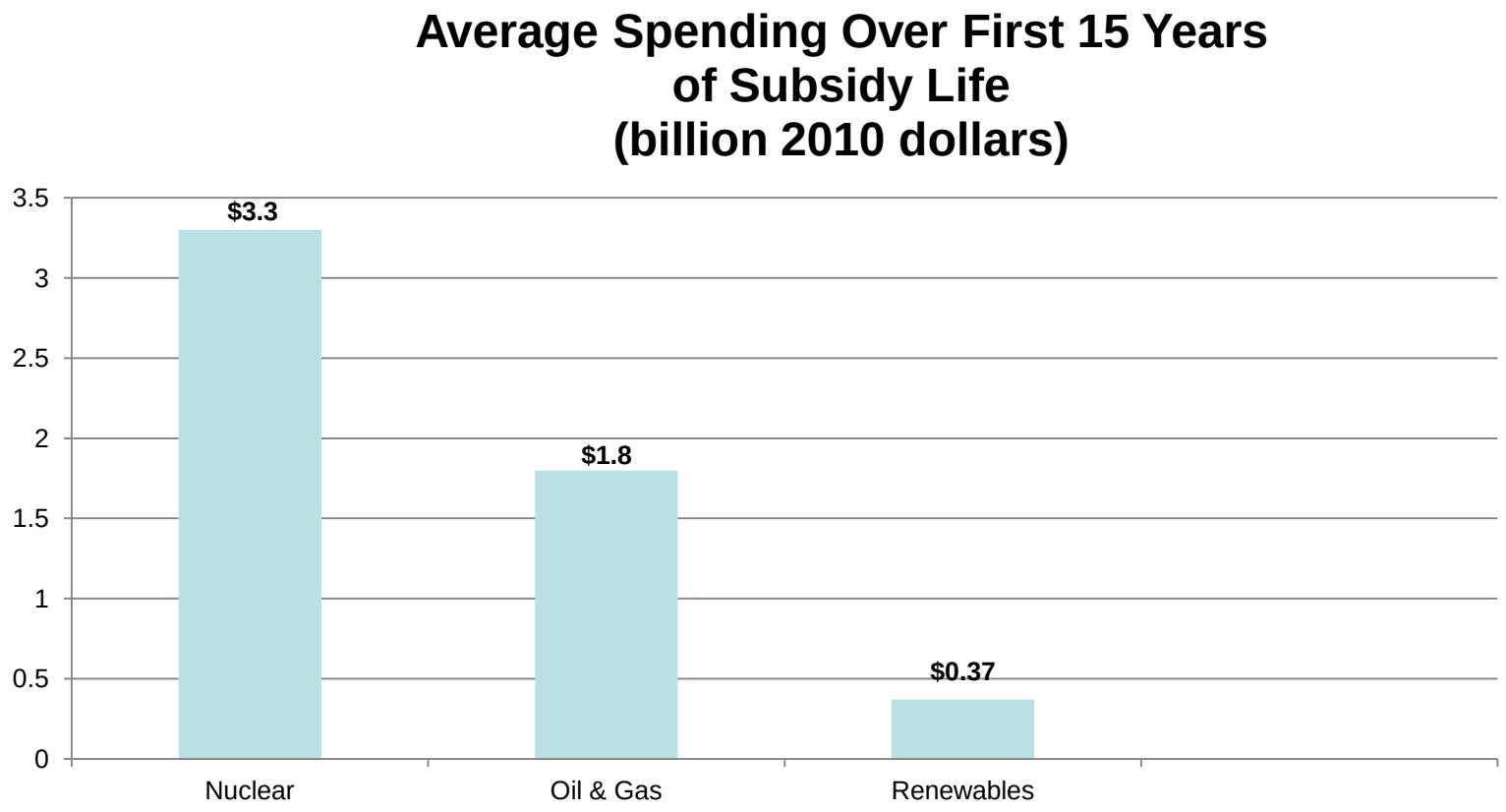
	1977	1981	1985	1989	1993	1997	2001	2005	2007	2009	2010
Fossil Fuels	6.2	10.65	6.36	0.64	1.56	2.75	3.18	2.78	7.42	2.62	2.4
Renewables		0.73	1.17	0.005	0.005	0.13	0.12	0.33	1.67	9.07	3.4

Cumulative Tax Expenditures for Fossil Fuels and Renewables (2010 Dollars, Billions)



Source: Congressional Research Service 2011. Figures may include expenditures related to transportation fuels.

Comparison of Early Federal Energy Subsidies*



Source: DBL Investors, September 2011. Figures may include subsidies related to transportation fuels.

*DBL states that it does not include a quantification of coal subsidies due to lack of access to data going back to the early 19th century.

Externalities

- Non-climate related (electric generation only):
  - Emissions of SO_2, NO_x, $PM_{2.5}$, and PM_{10} from Coal and Natural Gas Electricity Production have been estimated to result in an aggregated $62.7 Billion in damages to human health, visibility, agriculture, and other sectors in 2005.

    Source: National Academy of Sciences, 2010. Figures are in 2007 dollars.

- Climate related (includes transportation):
  - An estimate of the monetized damages associated with carbon emissions in the US in 2010 at $21 / metric ton CO_2.
    - 2010 United States emissions = $120 Billion in global damages, of which between approximately $8 billion to $28 billion will occur in the the United States.

    Source: Brookings Institution, 2011 and U.S. Government Interagency Working Group on Social Cost of Carbon, 2010. Figures are in 2007 dollars.

Summary

- Historically, and relative to conventional electricity generation resources, renewable electricity generation resources have not been heavily subsidized.

- Even in the short term, and even on a kilowatt hour basis, renewables likely have not been heavily subsidized relative to conventional resources if external costs are internalized.