How do subsidies affect oil drilling in the United States?

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SEI STOCKHOLM ENVIRONMENT INSTITUTE

U.S. government has reported over a dozen subsidies to producers

United States Self-Review of Fossil Fuel Subsidies
Submitted December 2015 to the G-20 Peer Reviewers

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We quantify affect of largest subsidies on all new oil fields in the U.S.

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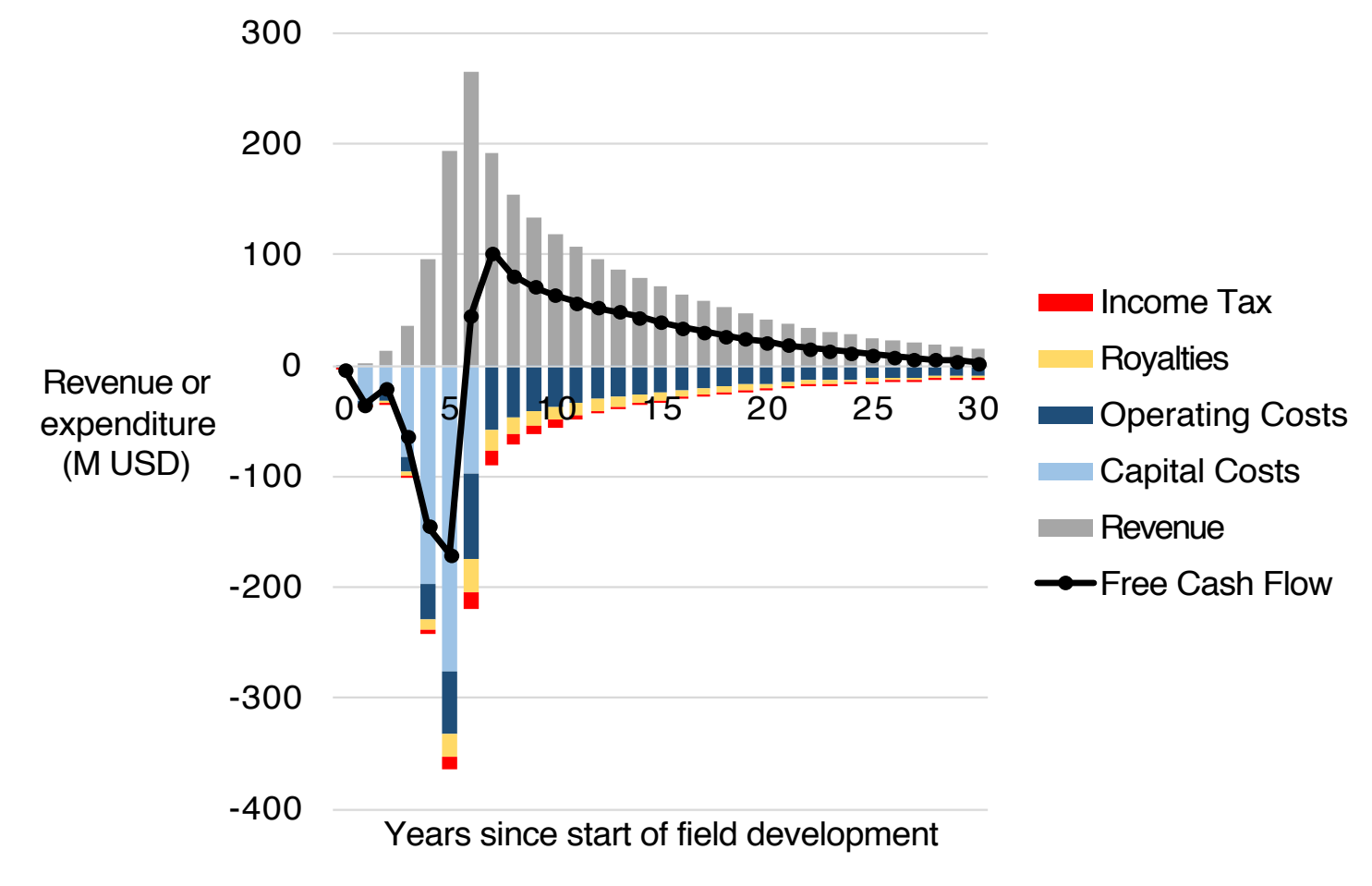
Source: U.S. Government (2015). United States Self-Review of Fossil Fuel Subsidies. Submitted December 2015 to the G-20 Peer Reviewers. http://www.oecd.org/site/tadffss/publication/.

But question remains: what effect?

- Prior findings differ
  - Researchers: Most subsidies (nearly all) to profit
  - Industry: No subsidies or, subsidies drive investment
- Here, for first time:
  - Field by field analysis (800+ fields)
  - Investor perspective (detailed cash flow analysis)
  - Broader list of subsidies – major federal subsidies plus state subsidies in two regions (North Dakota, Texas)

Cash flow perspective…(example)

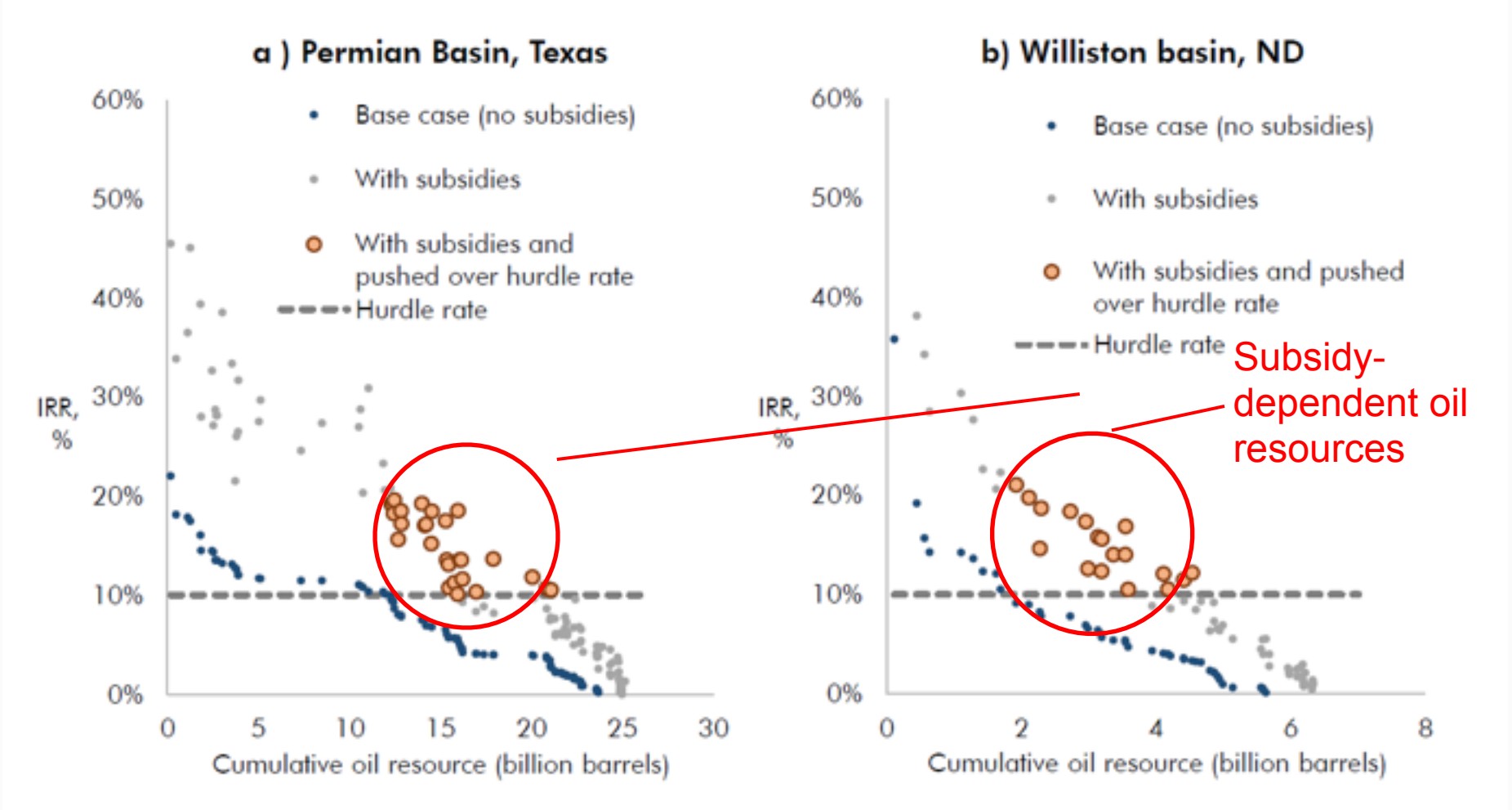


For details: Erickson, P., Down, A., Lazarus, M. and Koplow, D. (2017). Effect of Government Subsidies for Upstream Oil Infrastructure on U.S. Oil Production and Global CO2 Emissions. Stockholm Environment Institute (U.S.), Seattle, WA. https://www.sei-international.org/publications?pid=3036. Working Paper.

Method

- All (800+) discovered, not-yet-developed oil fields in U.S. (using data from Rystad Energy)
- Modify cash flow streams for each field based on eligibility (e.g., independent producers), use 10% hurdle rate (with sensitivity cases)
- A dozen subsidies (both federal and state)
- Deeper focus on three basins: North Dakota Williston, Texas Permian, U.S. (federal) offshore

Results, $50/bbl: Permian, Williston



Results, $50/bbl – National

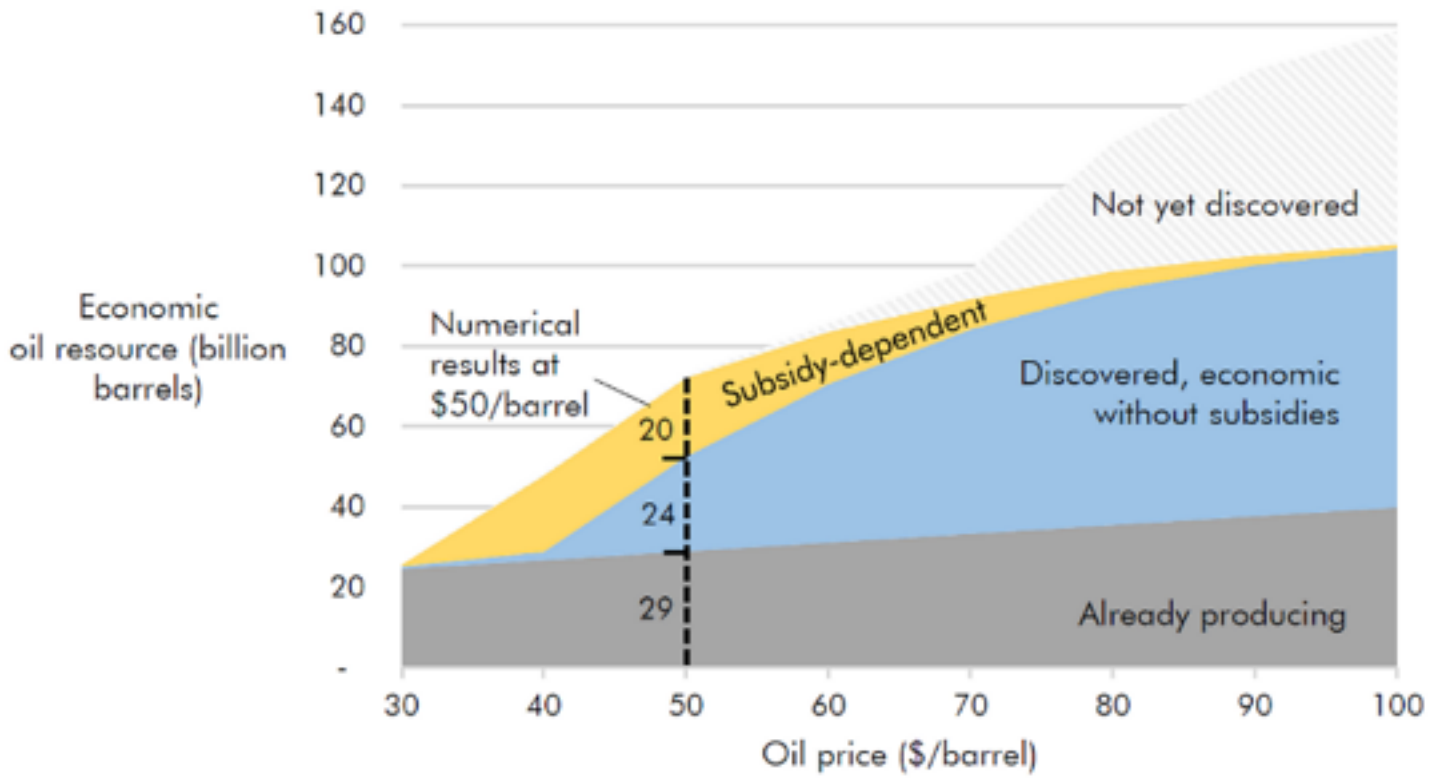
Table 4: Impact of subsidies on undeveloped oil resources and GHG emissions (at $50/bbl)

Area	Economic oil resources, discovered but not yet producing (billion barrels)	Percent subsidy-dependent	Increase in economic oil resources due to subsidies		Increase in net GHG emissions (Gt CO_2)
			(billion barrels)	(Gt CO_2)	
Williston basin	4.1	59%	2.4	1.0	0.2
Permian basin	20.3	40%	8.0	3.3	0.6
Gulf of Mexico	2.1	73%	1.5	0.6	0.1
Rest of U.S.	16.7	46%	7.6	3.1	0.6
Total U.S.	**43.3**	**45%**	**19.6**	**8.1**	**1.5**

Source: SEI analysis based in part on data from Rystad Energy.

Effect diminishes at higher prices

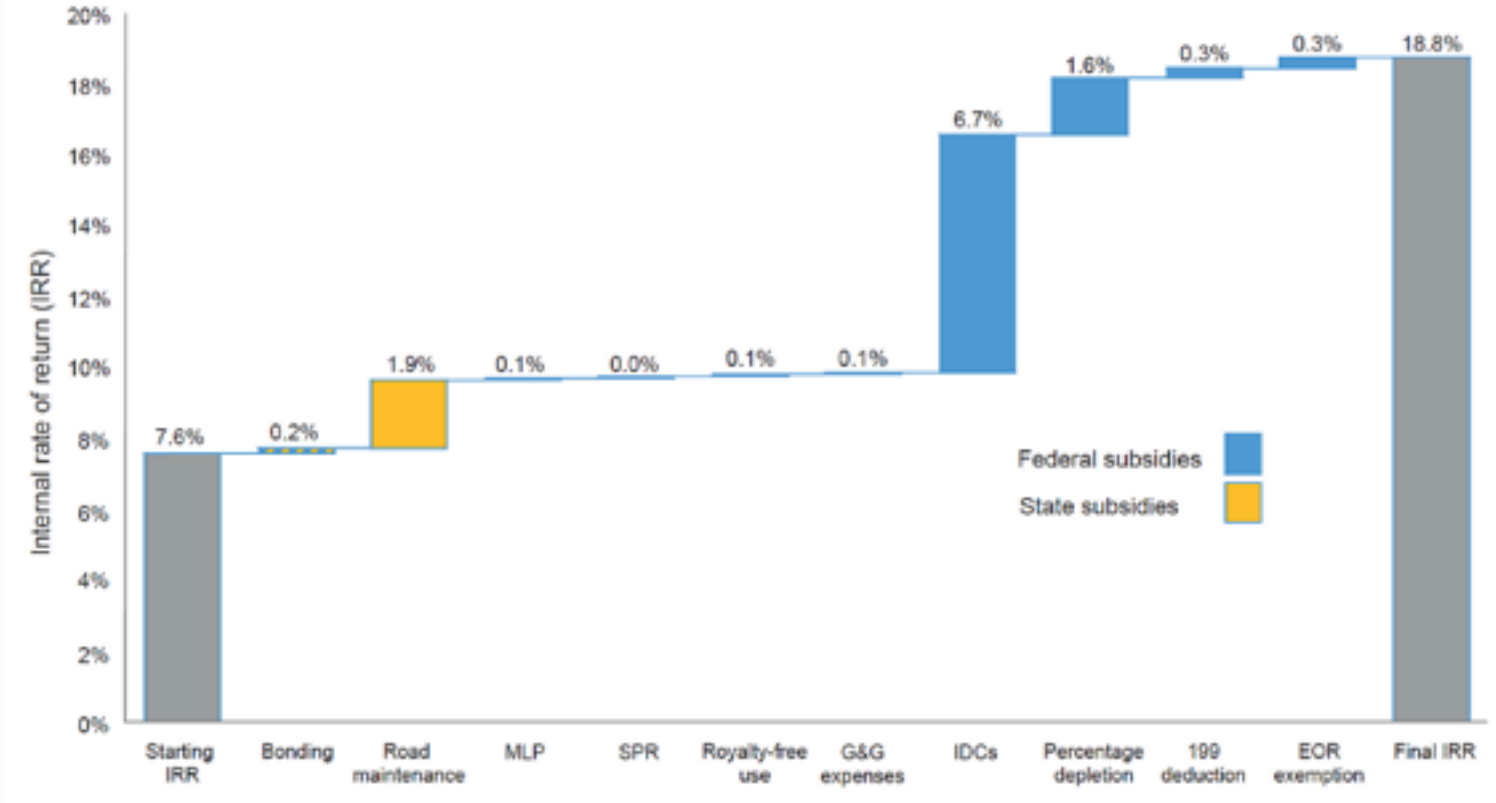
Figure 2: Share of U.S. oil resources that are subsidy-dependent as a function of oil prices



Note: The chart assumes a 10% hurdle rate.

Federal tax subsidies largest,and…

Figure 3: Average effect of each subsidy analyzed in the Permian Basin of Texas at $50 per barrel (average effect on a production-weighted basis across all fields)



Key points

- Considerable tax expenditures and other subsidies go to projects that would have happened anyway (half)
- At current prices, subsidies set to unlock about 8 Gt CO_2 worth of oil that wouldn't be developed otherwise (up to a quarter of a U.S. carbon budget for oil)
- Inefficient spending, expansion of carbon-intensive fuel: strengthen case for subsidy reform?

Thank you

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- Paper reference:

  Erickson, P., Down, A., Lazarus, M. and Koplow, D. (2017). Effect of Government Subsidies for Upstream Oil Infrastructure on U.S. Oil Production and Global CO2 Emissions. Stockholm Environment Institute (U.S.), Seattle, WA. https://www.sei-international.org/publications?pid=3036