DENHAM CAPITAL

Renewable Energy & Energy Efficiency Advisory Committee

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International Trade Administration

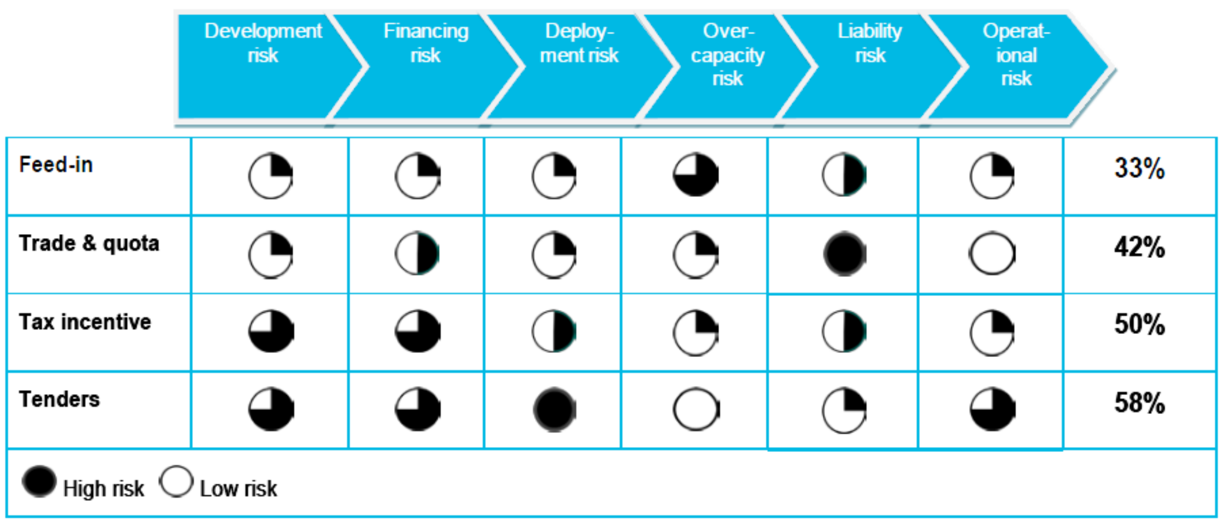
Denham Capital

- Denham Capital is an energy and commodities focused private equity firm with over $4.1 billion of assets under management
- Select Denham investments in renewable energy:
  - Sunray Renewable Energy – European and Mediterranean PV solar developer, sold to SunPower in 2010
  - Gradient Resources – Western U.S. geothermal developer
  - BioTherm Energy – South African wind and solar developer
  - Greenleaf Power – U.S. biomass power plant acquisition platform
  - Plantation Energy – Australian producer of wood pellets used for co-firing in power generation
  - Big Island Carbon – Hawaiian manufacturer of activated carbon using waste material
- General conclusions we would make on renewables are that, where government incentives are necessary to spur growth:
  - A clear policy decision needs to be made as to which side you want to err on, growth or minimizing cost – you cannot achieve one without sacrificing some on the other
  - A lack of clarity with policy formulation and implementation is the single largest impediment to growth
  - The simpler and more straightforward, the better
  - Try your best to levelize the playing field

Incentive Methodologies

- The following tools have traditionally been used to incentivize renewables
  - "Supply push" (i.e. lowers the cost of the product to the market)
    - Tax incentives (PTCs, ITCs, bonus depreciation)
    - Financing incentives (DOE grants and loan guarantees, Treasury cash grants in lieu of ITCs)
  - "Demand pull" (i.e. sets a price that's attractive to the market)
    - Feed-in Tariffs
    - Trade & quota programs (Renewable Portfolio Standards/"RPS", Green Certificates/"GCs")
    - Tenders/RFPs/auctions

Figure 10: Risks across the development value chain by type of policy scheme (%)

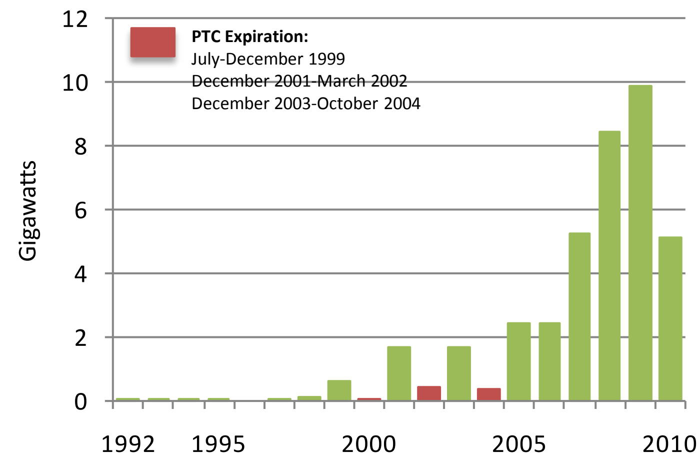


Source: Bloomberg New Energy Finance Note: Percentages in the last column represent the average risk across all fields for the specific policy schemes where the full circle represents 100% risk.

Tax Incentives: Complex and Unclear Policies

- Renewable energy policy becomes part of entirely unrelated political discussions on the federal budget and tax code, with many other things in play
- Expiry dates and policy renewal uncertainty creates chaos, impedes growth and drives up cost
- Handicaps entrepreneurs/businesses without tax appetite
  - Additional risk/uncertainty/cost is created when an additional stakeholder with tax appetite (i.e., tax equity) is needed to realize value from tax incentives
  - Multiple parties senior to cash equity creates intercreditor "meat in the sandwich" issues
  - Relatively thin and volatile tax equity market since tax credit demand dependent on forecasting future income
- Complexity of tax structure and uncertainty related to policy decisions increases cost of equity for early and late stage investors
- Arbitrary results such as "Tax Exempt Controlled Entities" cannot use Investment Tax Credits ("ITC")

Annual US Wind Capacity Additions, 1992 (year in which PTC legislation was first passed) through 2010

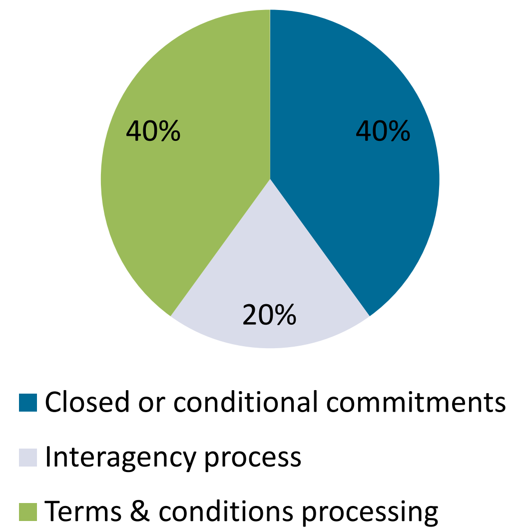


Source: CERA and American Wind Energy Association

Supply Push: Government Selects "Winners"

- Under DOE grants and loan guarantees, the government selects the winners and losers instead of the market
  - E.g., Solyndra
    - March, 2009 picked to win with $535M DOE loan guarantee
    - June, 2010 scuttles intended IPO
    - February 28, 2011 DOE loan restructured
- Appearances suggest politics and government relationships may play a role in receiving incentive versus pure merit
- At least twice, monies got redirected into other government programs because, as Senator Harry Reid said, DOE "has huge amounts of money they have not spent" on loan guarantees, and that the department had been "very, very slow in putting that money out."

Section 1705 $2.4 billion credit subsidy progress as of March 2011 (2 years into program)

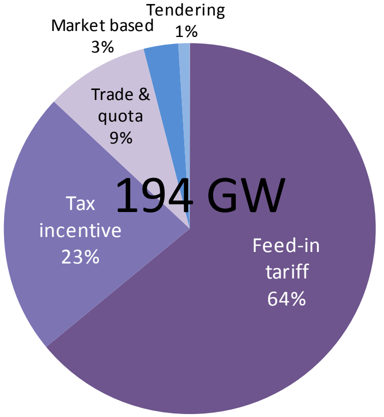


Source: Loans Programs Office, US Department of Energy

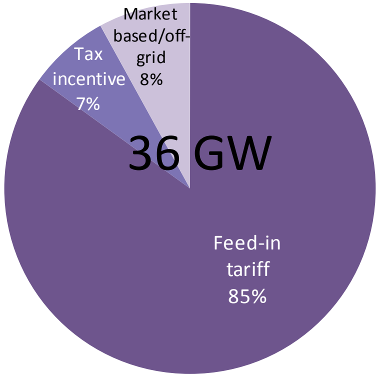
Demand Pull: Market Selects Winners

- Policy can create demand for renewable energy through Feed-In Tariffs (“FIT”), quota programs such as RPS or GCs, or RFPs/tenders/auctions
  - FIT is the strongest form of demand pull since the ultimate price for renewable energy output is known upfront and can be locked in by meeting specific requirements
  - RPS or GCs are weaker forms of demand pull since the incentive for market participants to demand renewable power is indirect, and they may not see a need to purchase the RECs or GCs under long-term contracts
  - RFPs/tenders/auctions for renewable power supply are also a weaker form of demand pull since there is uncertainty that winning bidders will be successful in delivering their projects
- But in all of these approaches, the market place determines the winners and losers
- Demand pull policies allow participants to adjust for the risks, incentives and deadlines that developers and investors face

Global wind installations by policy scheme (%)



Global solar PV installations by policy scheme (%)

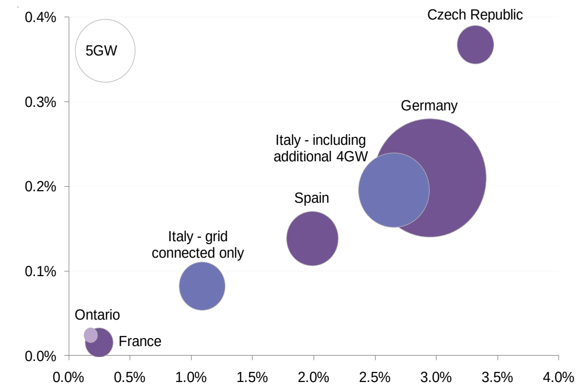


Source: Bloomberg New Energy Finance

Demand Pull Policies: Feed-In Tariff

- 64% of global wind capacity and 85% of solar PV have been deployed under FIT policies
- Guaranteed tariff empowers all equally, including pure entrepreneurs to develop/initiate projects
- Demand pull encourages manufacturers upstream to innovate, invest and expand to lower capital cost per kWh
- Risk of oversupply exists because of guesswork involved re timing of future reductions in costs and increases in efficiency
- FIT key considerations:
  - Liabilities need to be passed to end consumers instead of staying on government balance sheet (Spain)
  - Prospective tariffs should be systematically reviewed to account for greater than anticipated cost reductions and efficiency improvements

PV tariff costs as % of GDP versus PV share of consumption (%, %)



2010 wind tariffs versus wind penetration (€/MWh, %)

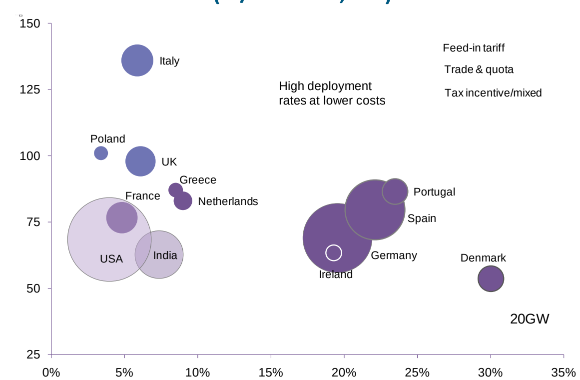


Chart 1 Note: Cost is net of wholesale electricity price. Size of bubble is cumulative installed PV at end of 2010, cost and PV electricity supply calculated on the basis of 2010

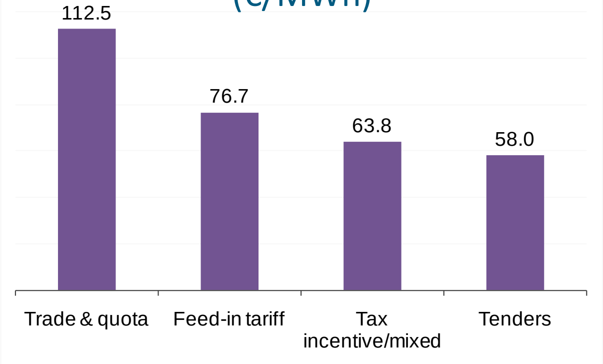
Chart 2 Note: Wind installations compared to total installed capacity in 2009. Tariffs levelized over 20 years of plant operation. Bubbles represent total wind installed capacity in each market by 2010.

Source: Bloomberg New Energy Finance

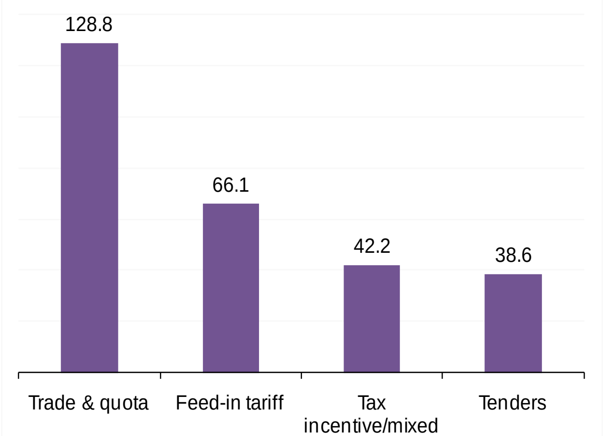
Demand Pull Policies: Trade and Quota / RPS

- Renewable energy generators are awarded Renewable Energy Credits ("REC") or Green Certificates for each MWh of energy production. RECs must be purchased by utilities and other load servers to cover their RPS obligations
- Highest cost incentive structure in Europe
- Unknown future cash flows due to market variability in determining price
  - Uncertain supply/demand balance
  - Demand set by government policy
  - Alternative compliance policies also establish price ceiling
  - Debt financing gravitates to GC floor pricing mechanisms and ignores any upside market pricing of GC's
- Higher risks for developers and banks adds cost
  - Undersupply (due to difficulties faced by developers) leads to high penalties paid by load servers and passed on to customers
- Italy (for wind) and UK will abandon their trade and quota systems to avoid further liabilities

Average wind tariffs by type of policy scheme (€/MWh)



Estimated annual liabilities per 1GW of installed wind capacity by policy scheme (€m)



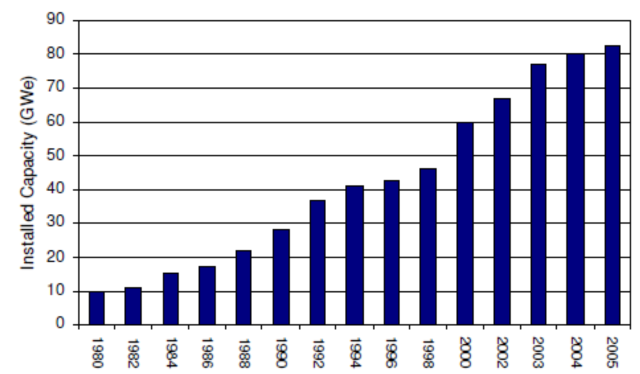
Note: Data considered from 5 different markets for the 'trade & quota' category (UK, Italy, Poland, Sweden and Romania), a further 19 markets for feed-in tariffs and only 4 markets for 'tax incentive'. Charts also include data from 22 wind tenders in Latin America and Asian markets. Tariffs are levelized for 20 years of plant operation

Source: Bloomberg New Energy Finance

Demand Pull Case Study: PURPA Tariffs

- Demand pull has been successful at creating positive results previously in the U.S.
- Under legislation passed in 1978, the Public Utility Regulatory Policies Act ("PURPA") mandated that power purchased from eligible renewable energy or cogeneration facilities be priced at the utility's full "avoided cost" of power
- Avoided costs were forecast over the long-term, serving as the basis for long-term PPAs between utilities and PURPA "Qualifying Facilities"
- In response to this FIT-like demand pull, renewable and cogeneration projects increased significantly, especially in those states with high avoided costs
  - According to the EIA, over 12,500 MW of non-hydro renewable energy capacity was added by 1996 because of PURPA
  - Many more MW of gas fired cogeneration facilities were installed as a result of PURPA (82GW of small power production facilities as of 2005)
  - Spurred innovations and reduced the cost of many technologies
- It wasn't perfect - the lessons learned from PURPA:
  - Design tariffs to minimize costs over periods covered by the tariffs

Cogeneration Capacity Growth in the USA

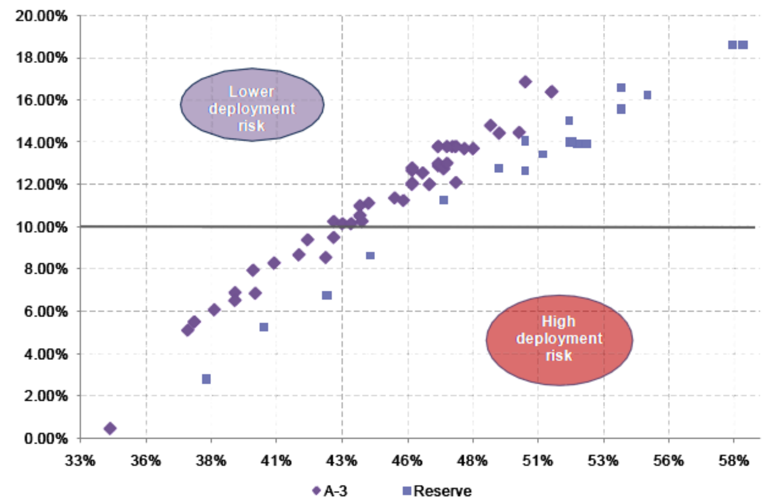


Source: U.S. Department of Energy 2005

Other Demand Pull Policies: Competitive Tenders

- Public tenders use competitive bidding to determine the pricing and recipients for PPAs, allowing selection of the lowest cost projects
- Often used in the developing world where energy prices are especially critical to economic development
- Risky option as aggressive bidding poses financing and deployment risk for projects (Latin America, California)
  - Unfinanceable/uneconomic projects not completed
- Risks can be mitigated by:
  - Strong penalties and collateralization for non-deployment
  - Bidder qualification requirements for resource assessment and operations experience
  - Focus on mature technologies (wind, mini-hydro, biomass)

Estimated Equity Returns of Winning Bids in the Brazilian A-3 and reserve tender in 2010 and their respective capacity factors (%, %)



Source: Bloomberg New Energy Finance

Summary: Increasing Investment in Renewables

- Investors and developers want:
  - Long-term visibility of cash flows
  - Transparency of the process
  - Stability of policy
  - A level playing field

- Tax incentives only add complexity/cost to system and do not clearly drive policy

- Important to pick your poison:
  - Low cost incentive, competitive bidding may lead to too little renewable energy development
  - High cost incentive guarantees renewable energy development but bleeds in “excess returns” for those able to move quickly and arbitrage cost decreases

- A well thought through feed-in tariff system presents the best type of policy to attract investment if you want to err on the side of growth
  - The trick for the US is to do that on a federal level even though state legislators and PUC’s control rates

ECA/DFI Financing

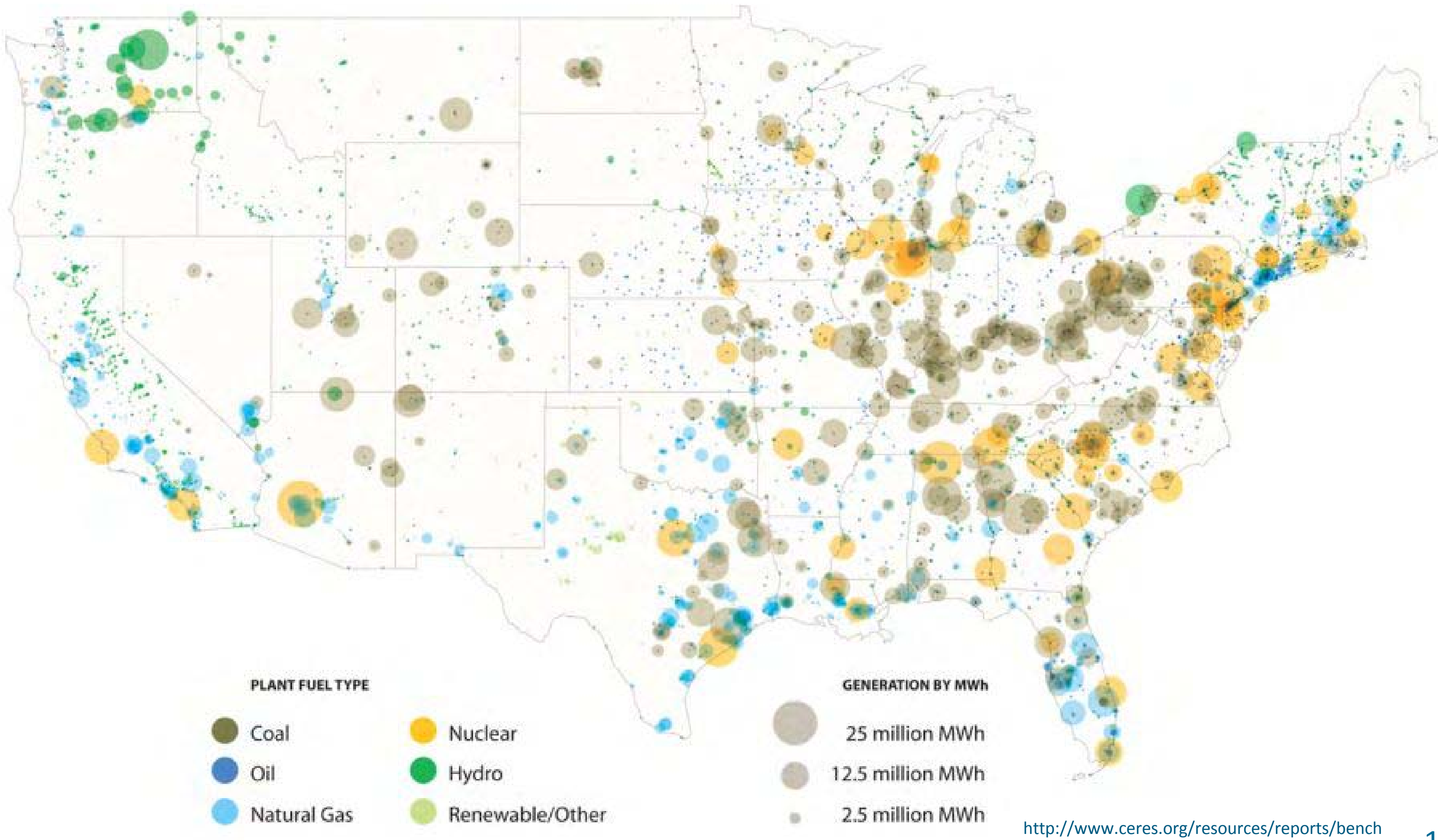
- ECA/DFI financing can be hugely helpful; examples of Denham's experience on such financings:
  - Relied on Sinosure and China Development Bank in a power project in the Philippines
  - May use Chinese, U.S. or European ECA financing for wind projects in South Africa
  - Working with OPIC, IADB and IFC on a chemical processing development project in Trinidad

- Need for additional flexibility in US Eximbank and OPIC's requirements in supporting U.S. export of goods and services, and U.S. investment overseas, respectively
  - US Eximbank financing limited to lesser of (1) 85% of value of 85% of the value of all eligible goods and services and (2) 100% of the U.S. content in U.S. supply contract
  - OPIC usually requires at least 25% ownership by U.S. investor through term of its loan
    - Have expressed willingness to be more flexible on this requirement for projects in Africa where they are keen to deploy funds
  - Ability to lend in other currencies

Appendix: Energy in the United States

FIGURE 2

Location and Relative Size of U.S. Power Plants by Fuel Type

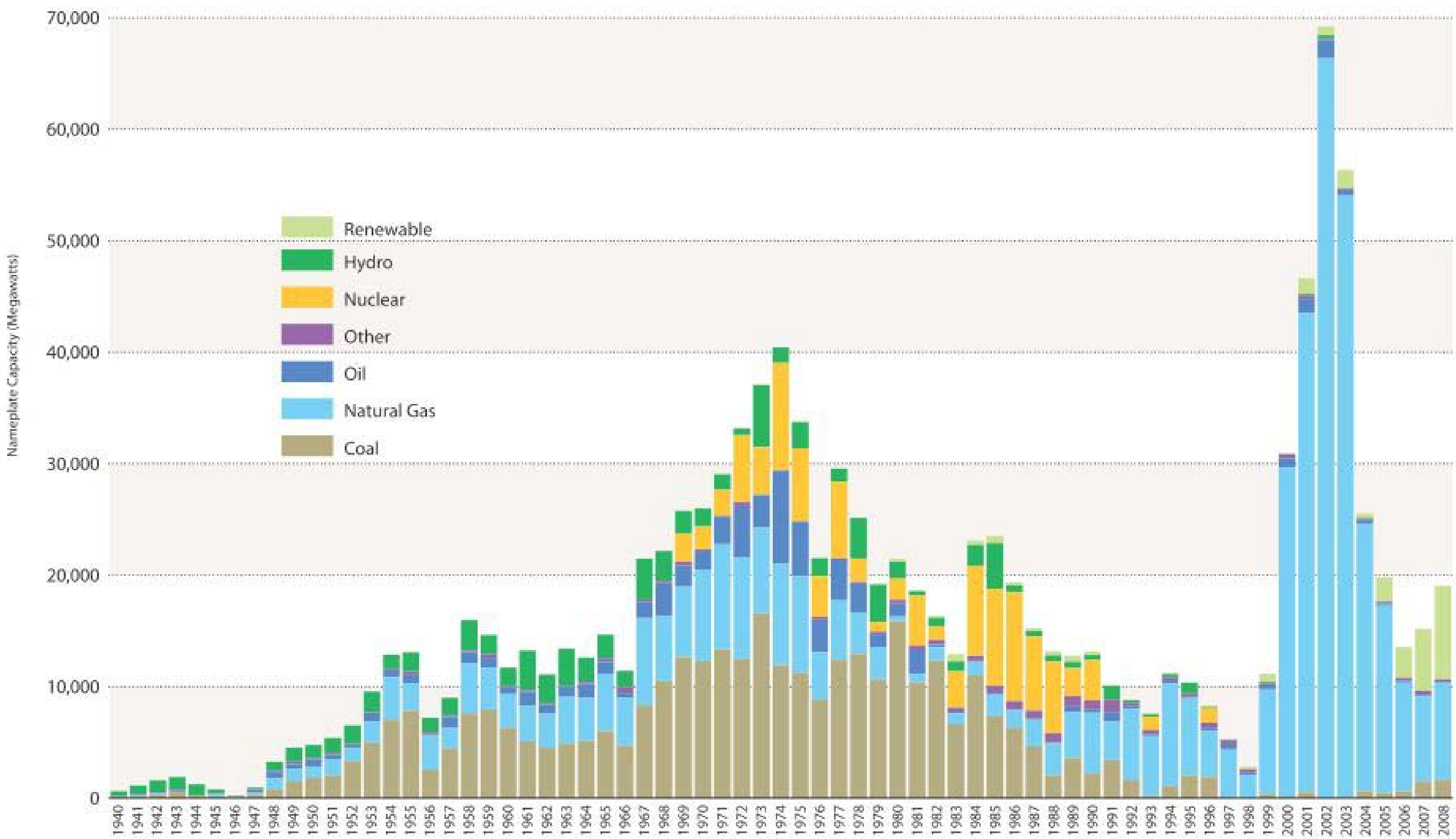


http://www.ceres.org/resources/reports/benchmarking-air-emissions-2010/view

Appendix: Energy in the United States

FIGURE 4

U.S. Electric Generating Capacity by In Service Year



SOURCE: ENERGY INFORMATION ADMINISTRATION. ANNUAL ELECTRIC GENERATOR REPORT: FORM EIA-860 (2008).
http://www.eia.doe.gov/cneaf/electricity/page/eia860.html

http://www.ceres.org/resources/reports/benchmarking-air-emissions-2010/view