IL RUOLO DEGLI IDROCARBURI NON CONVENZIONALI NEL MERCATO GLOBALE DELL'ENERGIA

Fare i conti con l'ambiente
Rifiuti acqua energia
Ravenna
21.22.23 maggio 2014

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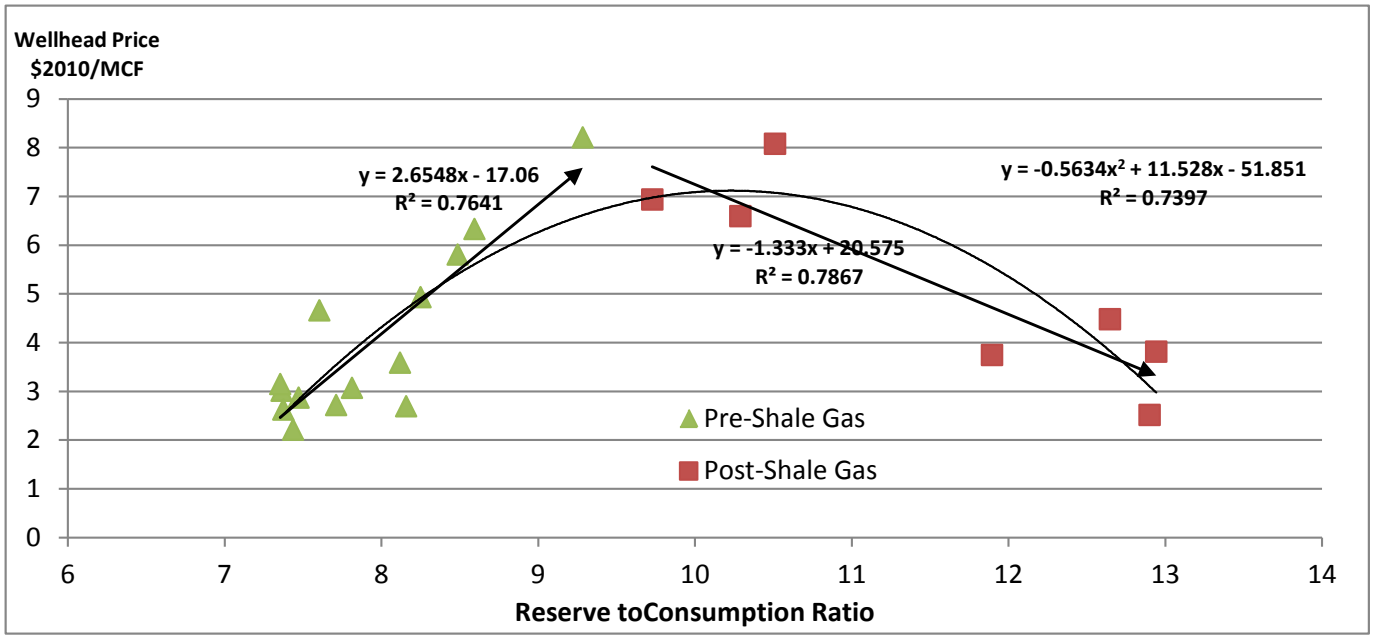
….the strong development of the shale gas search and extraction in the Central and North-West part of US, that is rapidly changing also many political strategies, allowing f.i. the US to look differently with respect to the past to Arab oil-based power and put themselves on the market as **energy exporters**.

However, **fracking will probably face in the next future some consensus issues** due to the still lacking information about the medium-long term environmental consequences of the extraction procedures (**water tab pollution, extensive use of chemicals**, etc.).

and, as far as today, the planned Keystone XL pipeline linking Alberta oil sands fields and US shale gas resources to the big refineries and ship terminals in the Gulf of Mexico, is still under scrutiny by EPA and the Obama administration.

…. In EU too, potential shale gas fields have been identified and tested.

The Shift in the Natural Gas Supply Curve



Sources: EIA, Natural Gas Data; Nymex Henry Hub.

Ref: RENAISSANCE IN REVERSE:
COMPETITION PUSHES AGING U.S. NUCLEAR REACTORS TO THE BRINK OF ECONOMIC ABANDONMENT
MARK COOPER, July 2013.

Chicago Tribune

April, 26th, 2014

Ravenna 21.22.23 maggio 2014

- …as temperatures plunged to **16 below zero** in Chicago in early January and set record lows across the eastern U.S., electrical system managers implored the public to turn off stoves, dryers and even lights or risk blackouts.
- A fifth of all power-generating capacity in a grid serving 60 million people went suddenly offline, as **coal piles froze**, sensitive electrical equipment went haywire and utility operators had trouble finding enough natural gas to keep power plants running. The wholesale price of electricity skyrocketed to nearly **$2** per kilowatt hour, more than **40** times the normal rate. The price hikes cascaded quickly down to consumers.

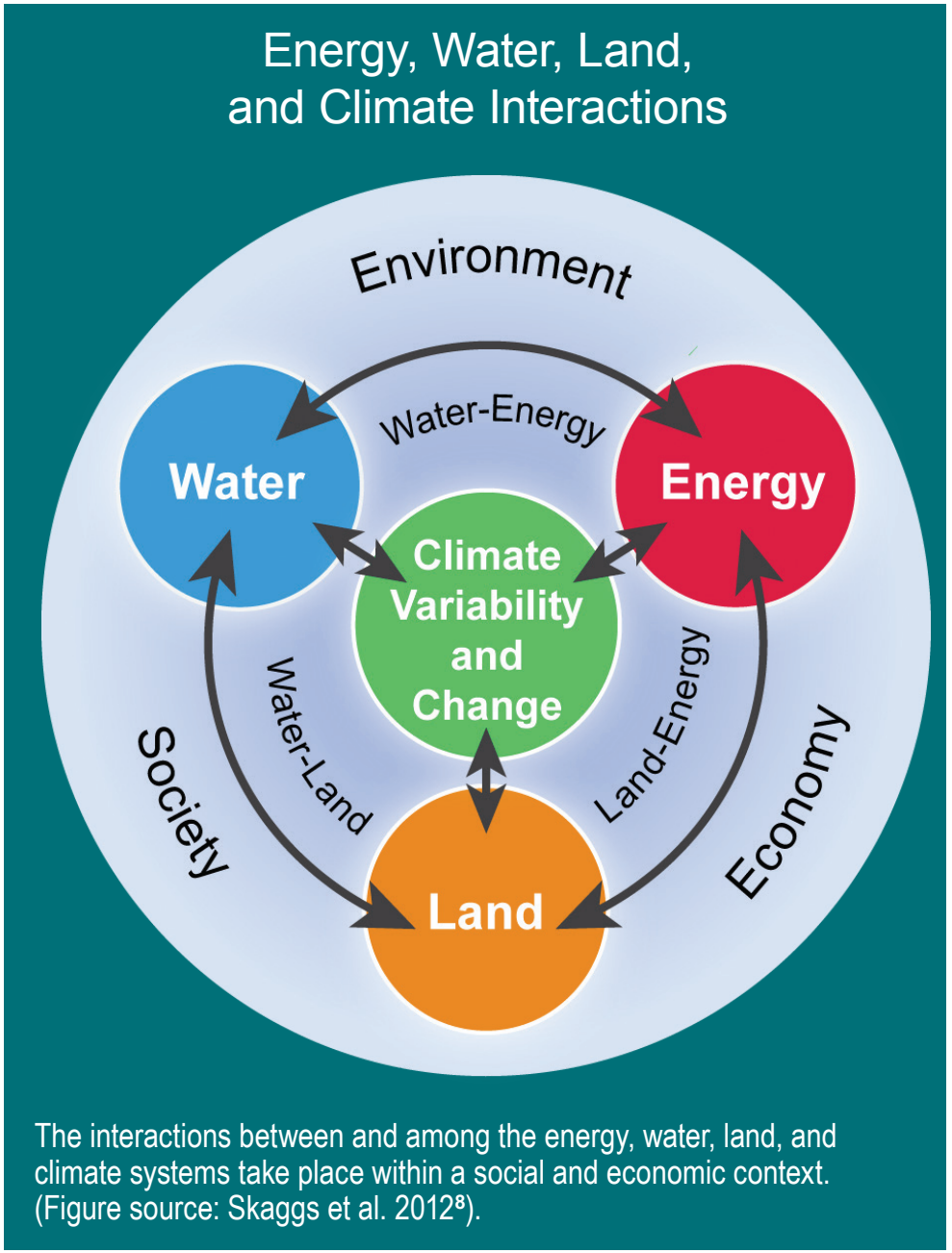
- The federal government appears to have underestimated the impact as well. An Environmental Protection Agency analysis in 2011 had asserted that new regulations would cause few coal plant retirements. **The forecast on coal plants turned out wrong almost immediately, as utilities decided it wasn't economical to upgrade their plants and scheduled them for decommissioning**.
- The lost coal-generating capacity is being replaced largely with cleaner natural gas, but the result is that electricity prices are linked to a fuel that has been far more volatile in price than coal. The price of natural gas now stands at about $4.50 per million BTUs, more expensive than coal. Plans to export massive amounts of liquefied natural gas, the rapid construction of gas-fired power plants and the growing trend to convert the U.S. heavy truck fleet to natural gas could exert even more upward pressure on prices. Malcolm Johnson, a former Shell Oil gas executive who now teaches the Oxford Princeton Program, a private energy training company, said prices could move toward European price levels of $10.

- California has all but phased out coal-generated electricity. The state lost the output of San Onofre's two nuclear reactors and is facing the shutdown of 19 gas-fired power plants along the coast because of **new state-imposed ocean water rules by 2020**.

Climate Change Impacts in the United States

	Midwest	Longer growing seasons and rising carbon dioxide levels increase yields of some crops, although these benefits have already been offset in some instances by occurrence of extreme events such as heat waves, droughts, and floods.
	Great Plains	Rising temperatures lead to increased demand for water and energy and impacts on agricultural practices.
	Southwest	Drought and increased warming foster wildfires and increased competition for scarce water resources for people and ecosystems.
	Northwest	Changes in the timing of streamflow related to earlier snowmelt reduce the supply of water in summer, causing far-reaching ecological and socioeconomic consequences.

nca2014.globalchange.gov



The interactions between and among the energy, water, land, and climate systems take place within a social and economic context. (Figure source: Skaggs et al. 2012[8]).

- **Energy Efficiency:** Reduction in CO2 emissions from energy end-use and infrastructure through the adoption of energy-efficient components and systems – including buildings, vehicles, manufacturing processes, applicances, and electric grid systems;
- **Low-Carbon Energy Sources:** Reduction of CO2 emissions from energy supply through the promotion of **renewables (such as wind, solar, and bioenergy), nuclear energy, and coal and natural gas electric generation with carbon capture and storage**

Annual Energy Outlook 2014 With Projections to 2040
April 2014
U.S. Energy Information Administration

Figure ES-1. U.S. crude oil production in three cases, 1960-2040 (million barrels per day)

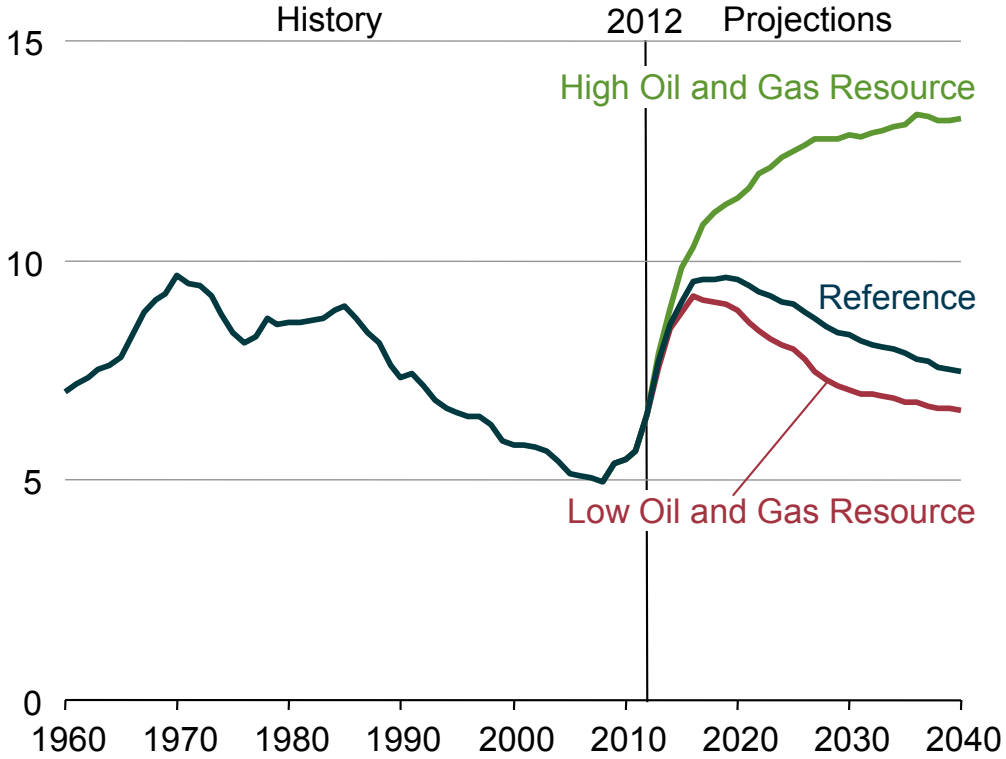


Figure ES-5. Electricity generation by fuel in the Reference case, 1990-2040 (trillion kilowatthours)

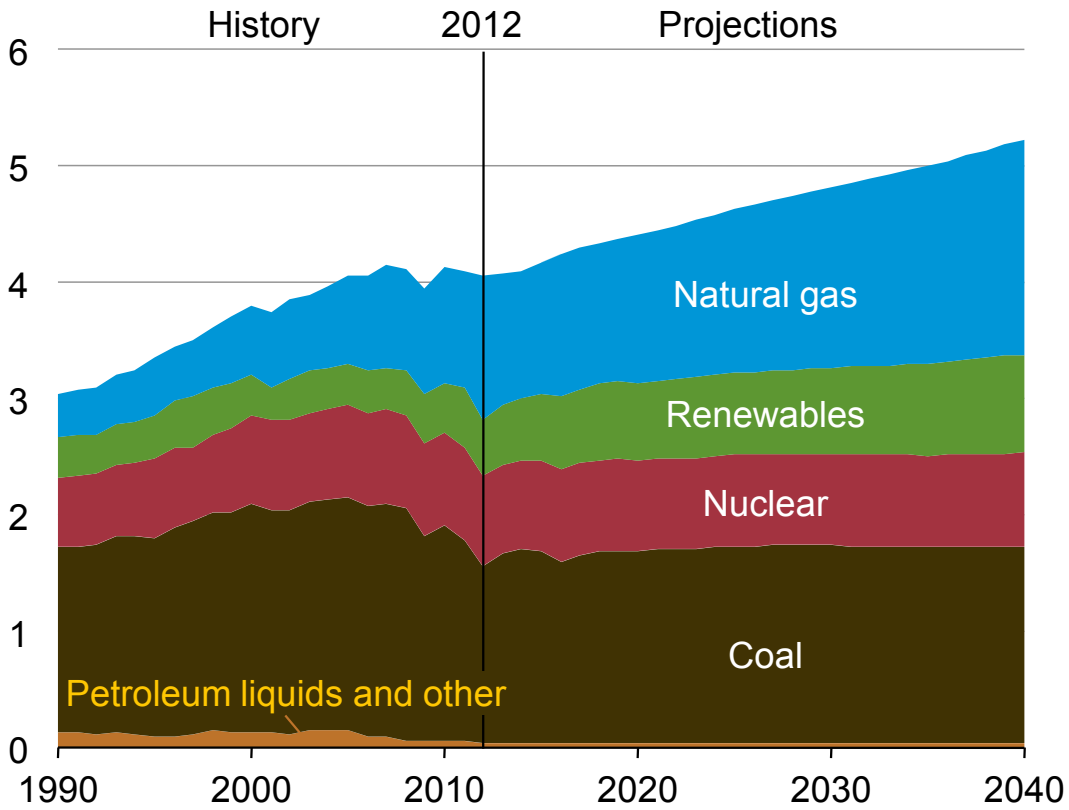


Figure ES-6. Nonhydropower renewable electricity generation in eight cases, 2005-40 (billion kilowatthours)

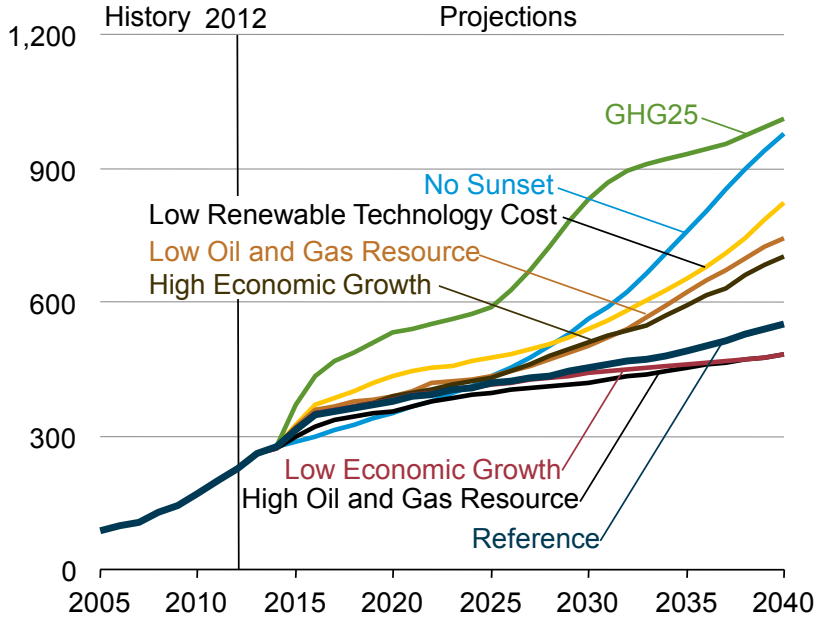


Figure ES-7. Energy-related carbon dioxide emissions in five cases, 2000-40 (million metric tons)

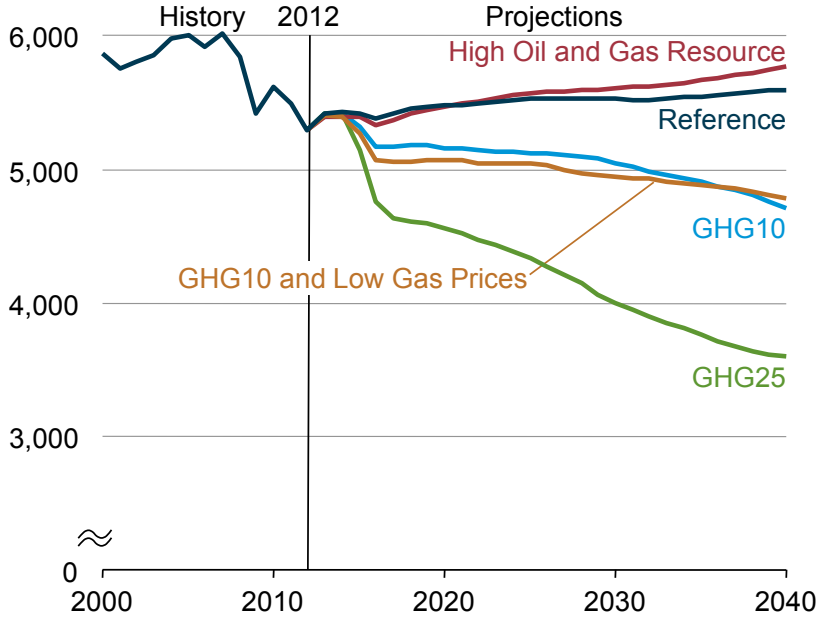


Figure IF1-6. Average delivered prices for natural gas in three cases, 2005-40 (2012 dollars per thousand cubic feet)

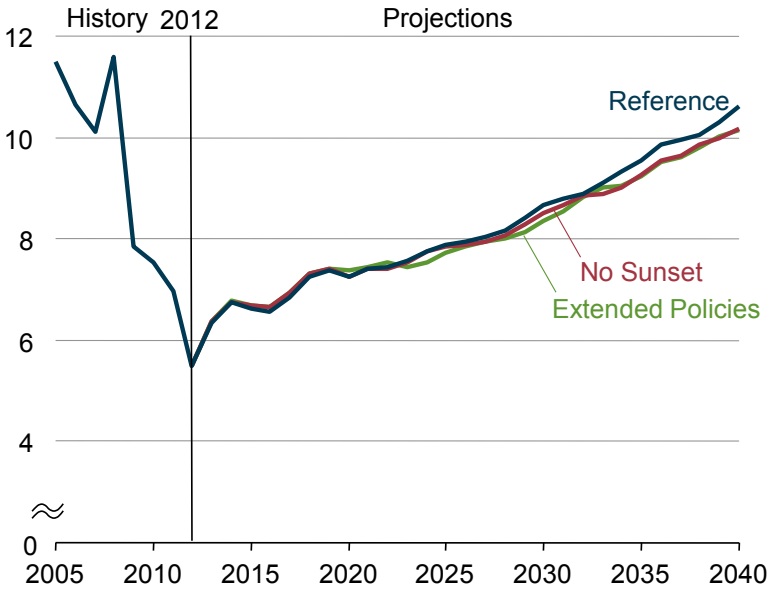


Figure IF1-7. Average electricity prices in three cases, 2005-40 (2012 cents per kilowatthour)

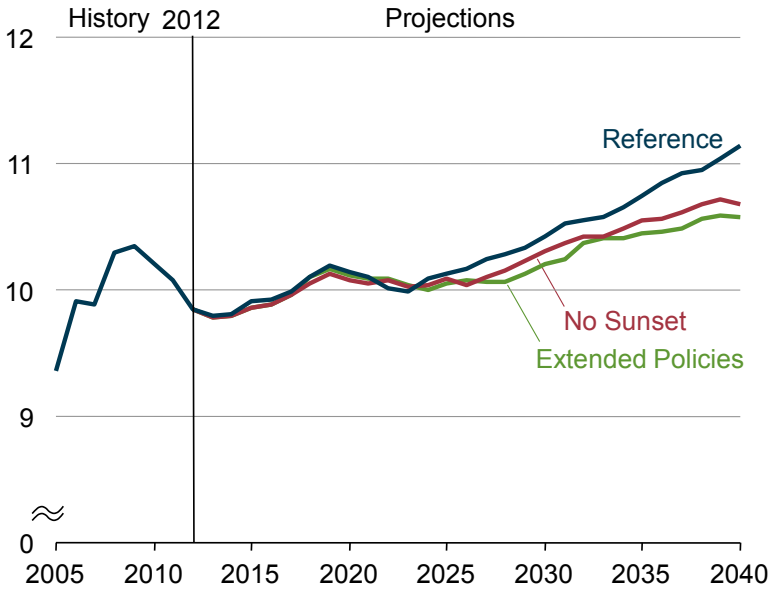


Figure IF6-3. Cumulative additions of electricity generating capacity by fuel in four cases, 2012-40 (gigawatts)

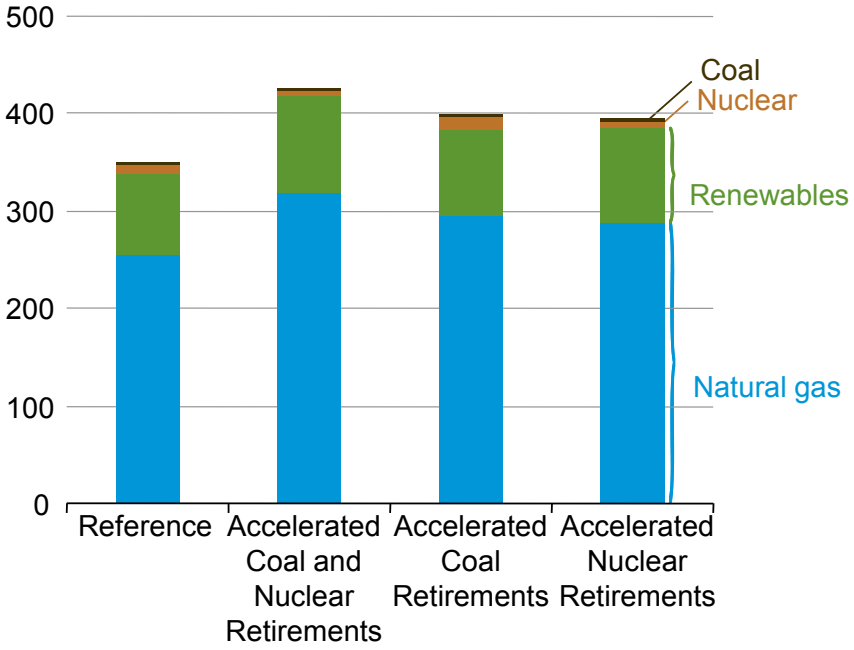


Figure IF6-4. Electricity generation by fuel in four cases, 2040 (billion kilowatthours)

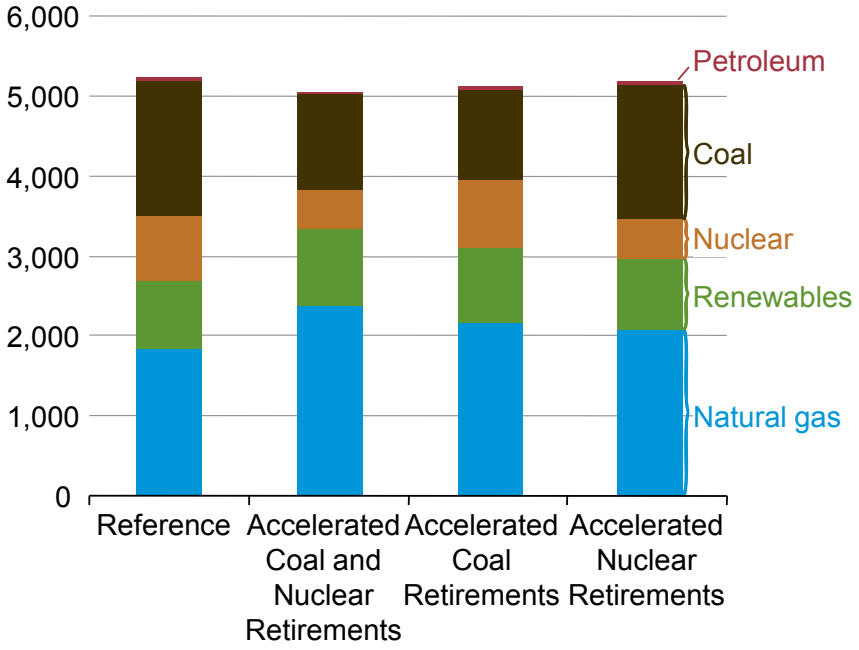


Figure IF6-5. Delivered price of natural gas to the electric power sector in four cases, 2012, 2025, and 2040 (2012 dollars per million Btu)

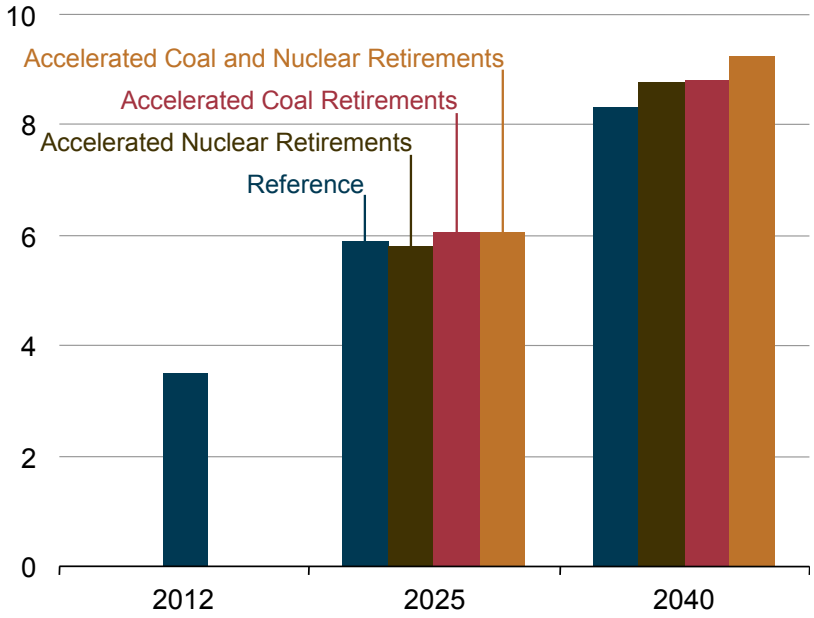


Figure IF6-6. Electric power sector carbon dioxide emissions in four cases, 2012-40 (million metric tons per year)

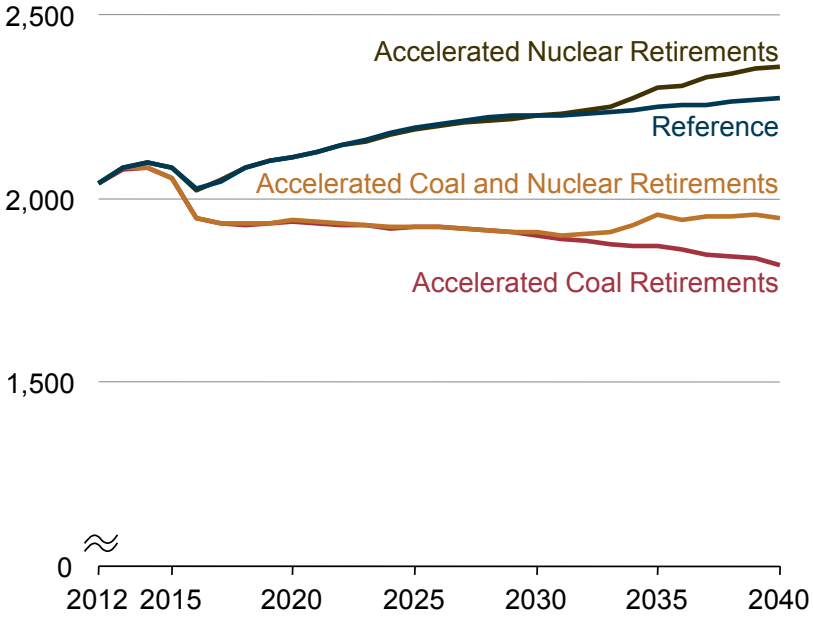


Figure IF7-1. Total U.S. electricity generation by energy source, 2012 and 2040 (billion kilowatthours)

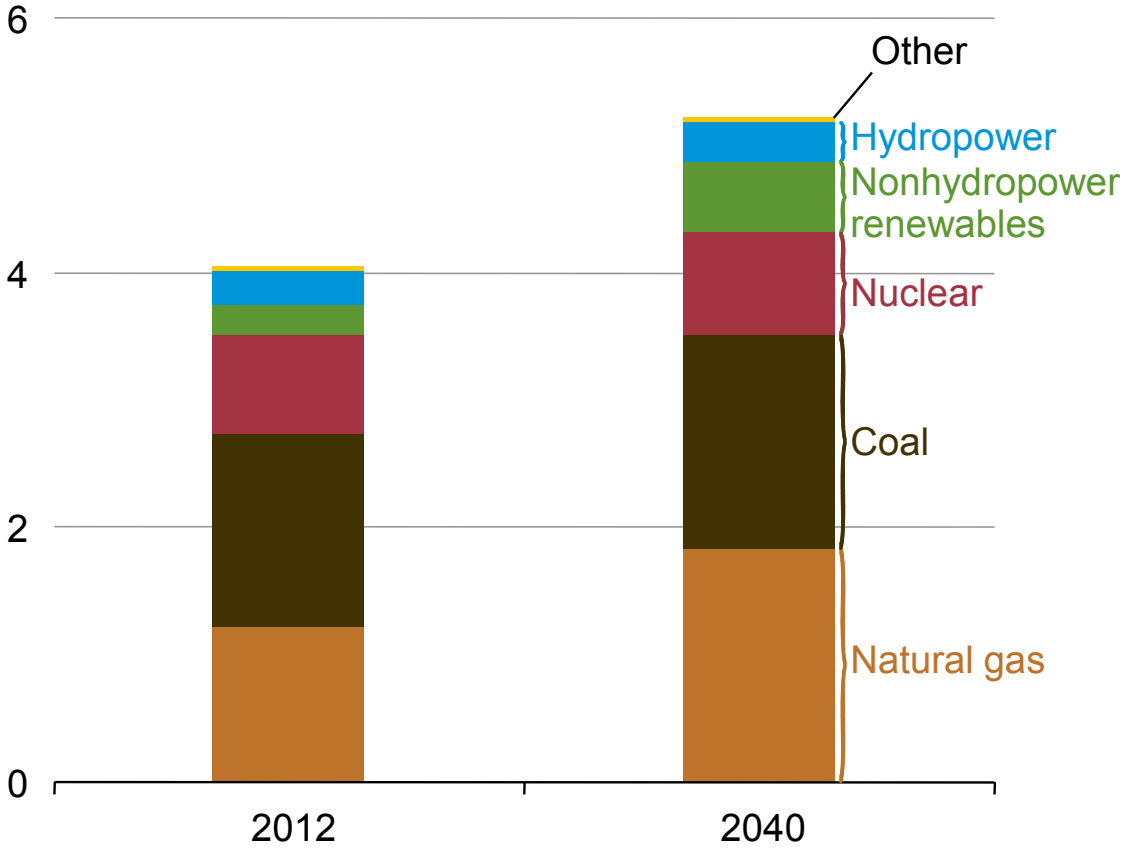


Figure IF8-2. U.S. total electricity demand by sector in two cases, 2012 and 2040 (billion kilowatthours)

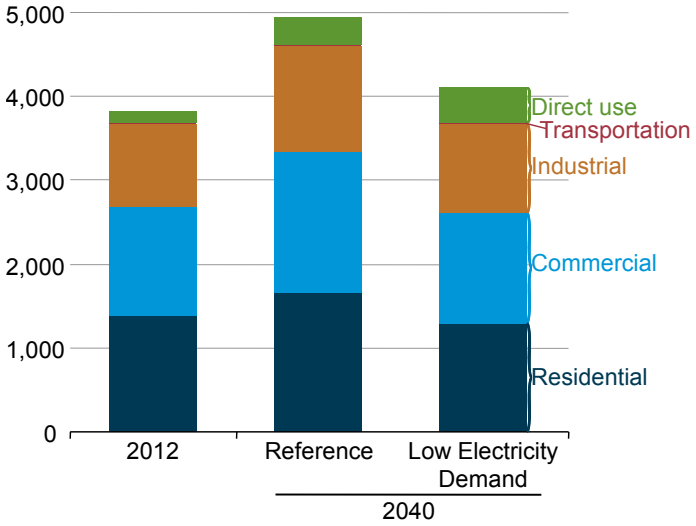


Figure IF8-3. Electricity capacity additions by fuel type in two cases, 2013-40 (gigawatts)

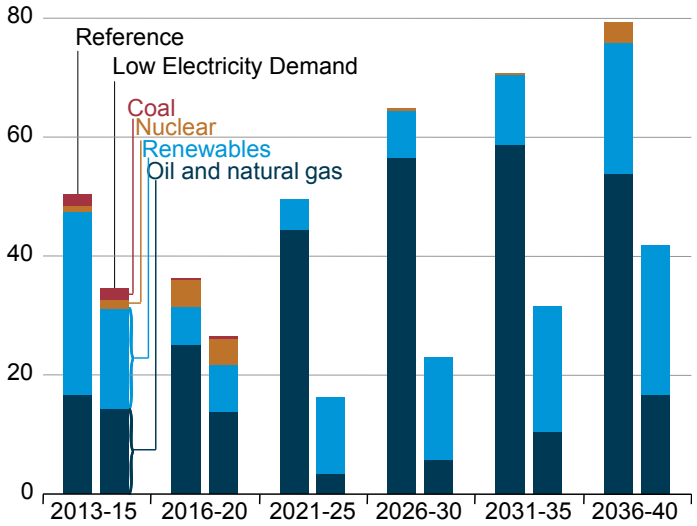


Figure IF8-4. Electric power sector cumulative retirements in two cases, 2013-40 (gigawatts)

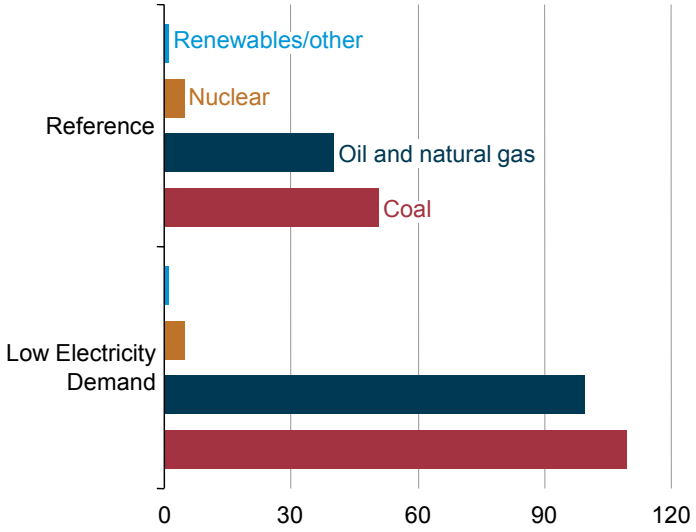
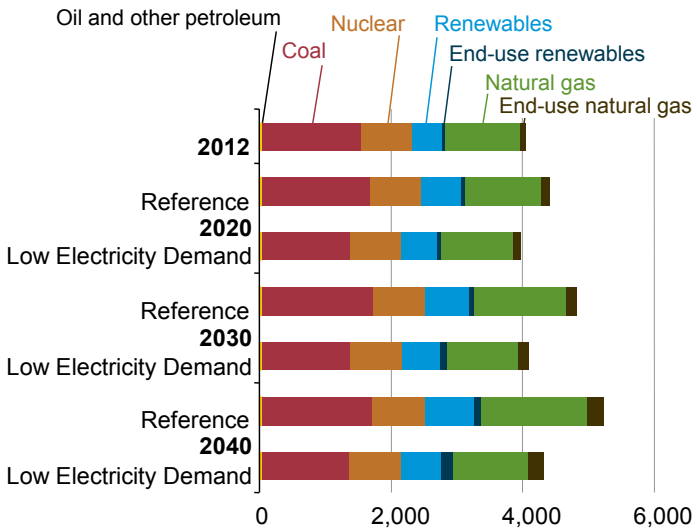


Figure IF8-5. Electricity generation in two cases, 2012-40 (billion kilowatthours)



	Projections							
	2012		2025		2035		2040	
	WTI	Brent	WTI	Brent	WTI	Brent	WTI	Brent
AEO2014 (Reference case)	94.12	111.65	106.99	108.99	127.77	129.77	139.46	141.46
AEO2014 (Low Oil Price case)	94.12	111.65	68.40	70.40	71.40	73.40	72.90	74.90
AEO2014 (High Oil Price case)	94.12	111.65	156.62	158.62	185.92	187.92	202.24	204.24
AEO2013 (Reference case)	94.12	110.43	117.41	119.45	145.96	147.99	163.54	165.57
SEER	94.15	111.63	60.00	64.00	54.00	56.00	52.00	54.00
ArrowHead Economics	94.12	111.65	101.94	108.34	119.61	124.00	131.34	135.42
Energy Ventures Associates (EVA)	94.12	--	85.64	--	106.01	--	--	--
INFORUM	--	111.65	--	123.86	--	154.26	--	171.16
Energy Security Analysis (ESAI)	--	111.50	--	99.10	--	125.30	--	131.30
IEA (Current Policies Scenario)[a]	94.12	111.65	--	127.00	--	145.00	--	--

-- = not reported.

[a]IEA mixed crude oil import prices are based on OECD member country reporting.