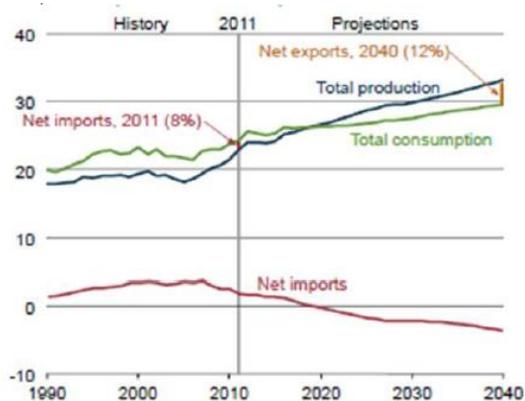


Letter from America—Perry Sioshansi

EIA sees US as net oil exporter by 2040

Not only is the US becoming self-sufficient in natural gas (see graph below left), but it could become a net exporter of oil, possibly by 2040, according to the latest projections of the US Energy Information Administration (EIA) in its *Annual Energy Outlook 2013*. The amazing transformation of the US energy sector, and its longer-term implications are chronicled in EIA's latest release.

Total US natural gas production, consumption, and net imports in EIA Reference case (trillion cf)



Source: EIA

The decline in use of coal and the gradual conversion to lower-carbon sources and fuels means that the US energy-related carbon emissions are on a slow growth path or a decline, even in the absence of any climate initiatives.

Renewable energy resources continue to grow, mostly driven by mandatory renewable portfolio standards (RPS) now in place in over two-thirds of US states. The projected growth is steep through mid-2020s; the current RPS targets have 2020 to 2030 deadlines, after which renewable growth flattens.

What happens after that? Your guess is as good as any, but there are at least two reasons to believe that the growth of renewables will continue:

- many states are likely to extend their targets, raising them to higher levels for future years. California, for example, which has to reduce its state-wide greenhouse gas emissions to 1990 levels by 2020, and 80% below by 2050, is likely to set much higher RPS targets for 2030, 2040 and 2050. Hawaii has already set a 40% target for 2030; and
- perhaps more important is that by mid 2020s, many renewables are expected to have reached grid parity, which means that their growth will continue even in the absence of any mandates or subsidies.

Overall US energy consumption is also anybody's guess. The outcome, of course, is not pre-ordained. Mandatory energy efficiency standards, better building codes, higher car mileage standards, more mass transit, amongst other factors, can influence how much energy is used, in the US or anywhere elsewhere.

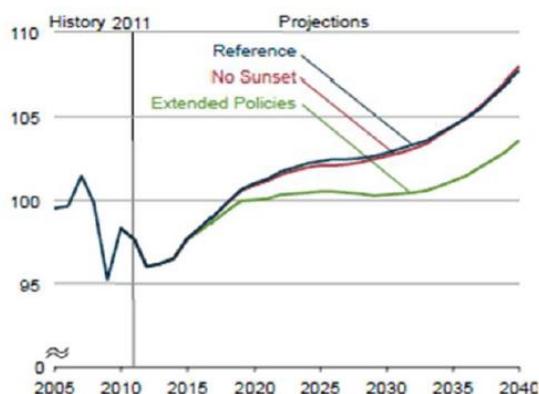
The EIA shows several scenarios of what the future may look like. The scenario labelled "extended policies" in the second chart on the previous page, for example, suggests that US energy consumption in 2035 could be roughly what it

Electricity generation from coal is projected to remain flat, or even decline over time—the latter more likely in this writer's view—while natural gas and renewables gain market share away from coal over time. This is not the message anyone in the US coal lobby wants to hear, but it seems inevitable for at least four reasons:

- natural gas is plentiful, cheap and comparatively clean;
- the future growth of renewables are mostly driven by state-level mandates, not markets;
- cost of renewables are expected to continue to decline—not the case for coal, nuclear or natural gas; and
- lastly, and in this writer's view only tangentially, proposed and pending rules by the Environmental Protection Agency (EPA) make coal a non-starter in the US.

The decline in use of coal and the gradual conversion to lower-

Total energy consumption in three cases, 2005-2040 (quadrillion Btu)



Source: EIA

is today, and below the peak experienced before the 2008 global financial collapse. All it takes to achieve such an outcome, easier on the consumers' pocket books and the environment, are higher standards for cars, appliances, homes, lights, and so on.

For nuclear die-hards, the EIA throws in a morsel of hope. But looking at new generation additions under any scenario, one does not see anything resembling the once hoped-for nuclear renaissance (see *graph right*).

The numbers do not even qualify as noise in the big picture. The conclusion is clear: nuclear power's best days in the US are behind us. It is the same for most other OECD countries with sizeable nuclear generation—France and the UK included—these are the views of the writer; the EIA does not dwell on international developments and is mute on projections beyond the US.

As already mentioned, total primary US energy demand shows little growth and is driven by four major sectors of the economy, all gradually becoming more efficient. Renewable resources, while growing, make little impact in aggregate terms—their presence is pronounced in the electricity sector but barely visible in aggregate terms.

EIA projects significant savings from conversion to more efficient appliances and devices in the electric sector. For example, lighting, a significant contributor to residential and commercial electricity consumption is expected to become far more efficient overtime.

Partly because of improvements in energy efficiency, EIA projects US electricity to grow by a mere 0.7% through 2040

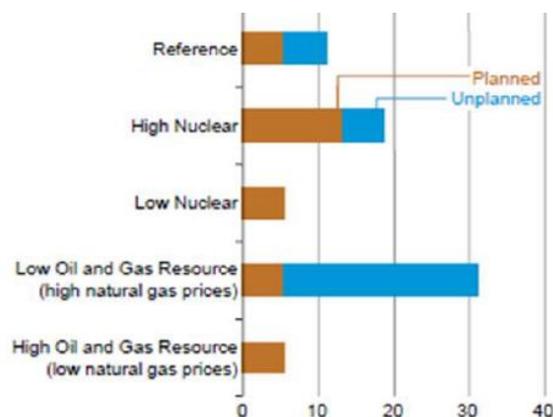
US electricity demand growth, 1950-2040



Source: EIA

Perry Sioshansi is a specialist in electricity sector restructuring, and he has been actively involved in discussions in a number of developed, developing and transition economies. He is founder and president of Menlo Energy Economics and is the editor and publisher of *EEnergy Informer*, from which we have sourced this article, and which we commend.

Nuclear capacity additions in five cases, 2011-2040 (GW)



Source: EIA

in its Reference Case (see *chart left*). This, many experts—this writer included—believe is too high for at least two reasons:

- first is the expected growth of energy efficiency programmes in an increasing number of states; and
- second is the projected growth of self-generation, which suggests that more consumers will generate more of what they need at home or at their businesses, hence buying less from the grid.

In other words, these two factors combined means that consumers will need less—due to energy efficiency gains—and will buy even less—due to solar rooftop PVs, solar hot water heaters, ground source heat pumps, CHP, fuel cells and so on—both options with declining costs.

Energy efficiency appears to be getting more traction and so is distributed generation.