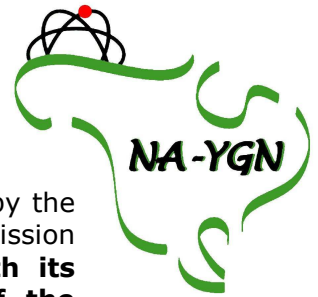


# The Role of Nuclear Power in Energy Diversification

Prepared by the Carolina Chapter of North American Young Generation in Nuclear



The US Department of Energy projects a 45% increase in electricity demand by the year 2030. We need to make use of largely-scaleable, yet low emission technologies to meet our future energy demands. **Nuclear energy, with its proven reliability and low greenhouse emissions, must be part of the solution for a sustainable and secure energy mix for our future.**

## What is our current energy mix?

- Coal
- Nuclear
- Gas
- Oil
- Hydro-electric
- Other (Includes Wind and Solar)

United States Generation<sup>[1]</sup>



North Carolina Generation<sup>[2]</sup>



South Carolina Generation<sup>[3]</sup>

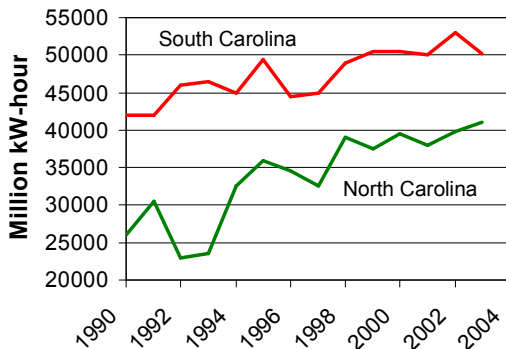


## How efficient and reliable is nuclear energy?

The power generated from one uranium fuel pellet from a typical reactor - about the size of your fingertip - is equivalent to (a) 17,000 cubic feet of natural gas, (b) 1,780 pounds of coal, or (c) 149 gallons of oil<sup>[4]</sup>.

Despite not having built any new US nuclear plants in the recent years, nuclear plants continue to improve their efficiency and produce more power.

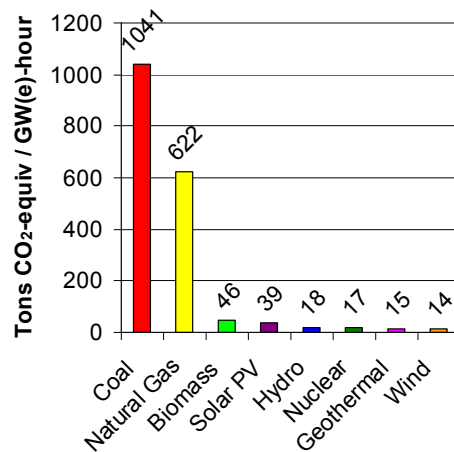
Nuclear Generation in the Carolinas<sup>[5,6]</sup>



## How much greenhouse gas does nuclear energy emit?

No energy source is 100% emission free - however, nuclear energy ranks amongst the lowest contributors to greenhouse emissions.

Total Life-Cycle Emissions<sup>[7]</sup>

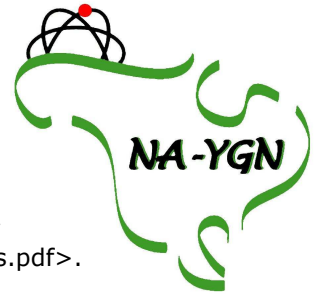


## Is nuclear energy cost effective?

An International Energy Agency study on the costs of generating electricity confirms that new nuclear plants can be competitive with coal and natural gas plants<sup>[8]</sup>. As of June 2006, 27 new nuclear power plants are under construction in 11 countries<sup>[9]</sup>. Nuclear reactors can produce power for up to 2 years before refueling. This protects nuclear power production costs from being adversely affected by short term volatility in fuel prices.

Fuel Mix	\$/MW-hour		\$/kW(e)
	5% Interest Rate	10% Interest Rate	Construction costs
Nuclear	21-31	30-50	1,000-2,000
Coal	25-50	35-60	1,000-1,500
Gas	37-60	40-63	400-800
Hydroelectric	40-80	65-100	N/A
Wind	35-95	45-140	1,000-2,000
Solar	150	200	N/A

For a list of references please refer to the back of the page



## References

1. Nuclear Energy Institute, *U.S. Electricity Generation Fuel Shares*, viewed 13 July 2006, <[http://www.nei.org/documents/U.S.\\_Electricity\\_Generation\\_Fuel\\_Shares.pdf](http://www.nei.org/documents/U.S._Electricity_Generation_Fuel_Shares.pdf)>.
2. Nuclear Energy Institute, *Nuclear Energy in North Carolina*, viewed 12 July 2006, <[http://www.nei.org/documents/States\\_NC.pdf](http://www.nei.org/documents/States_NC.pdf)>.
3. Nuclear Energy Institute, *Nuclear Energy in South Carolina*, viewed 12 July 2006, <[http://www.nei.org/documents/states\\_sc.pdf](http://www.nei.org/documents/states_sc.pdf)>.
4. Nuclear Energy Institute, *NEI – Economical Energy Source*, viewed 14 June 2006, <<http://www.nei.org/index.asp?catnum=2&catid=48>>.
5. Energy Information Administration, *State Energy Data Report 1999*, and *Electric Power Annual, Volume 1, 2001*, and EIA Survey Form 906.
6. University of Wisconsin-Madison, *Life-Cycle Assessment of Electricity Generation Systems and Applications for Climate Change Policy Analysis*, Paul J. Meier, August 2002.
7. Energy Information Administration, Form EIA-906, Power Plant Report, and predecessor forms.
8. International Energy Agency, *Projected Costs of Generating Electricity*, pgs 51-52, 61-62, 66-67, 70-72, 2005 Update.
9. World Nuclear Association, *World Nuclear Power Reactors 2005-06 and Uranium Requirements*, 31 May 2006, <<http://www.world-nuclear.org/info/reactors.htm>>.

## About North American Young Generation in Nuclear (NA-YGN)

### YOUNG PROFESSIONALS

NA-YGN's members are individuals age 35 and under working throughout the fields of nuclear science and technology.

### BELIEVE

NA-YGN's members share a personal conviction that nuclear science and technology make important and valuable contributions to our society and will continue to do so in the future.

### WORKING TOGETHER

NA-YGN brings together the different sectors of nuclear science and technology to speak with a united voice for a common goal, and to provide professional development opportunities for its members.

### SHARE THEIR PASSION

NA-YGN shares its passion for nuclear science and technology by communicating with the public about the many ways in which these technologies impact their daily lives.

### ALIVE AND KICKING

Nuclear science and technology is alive and kicking, making tremendous advances in some areas and brimming with possibilities in others.

### **Contact Us:**

**[PublicInfo@carolina-naygn.org](mailto:PublicInfo@carolina-naygn.org)**