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# NuSubsidies



## Nuclear Consortium

*"Where the taxpayer is our favorite investor."*

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NuSubsidies Nuclear Consortium

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# NuSubsidies Nuclear Consortium (NNC): Overcoming the Challenges We Face

- Technology still too expensive.
- More competitors than ever; less ability to automatically pass through cost surprises.
- Heightened security challenges post 9/11.
- Fuel cycle complex, higher risk than competing power sources.
- Waste and RDE's\* remain an issue.

\*Radioactivity Dispersion Event

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# NuSubsidies Mission

- Quietly engage the taxpayer as an ally and investor in the future of our industry.
- Redirect discussions of nuclear subsidies or our uncompetitive new generation to more favorable topics such as the low operating costs of existing power plants.
- Shift as many technical, financial, procedural, and environmental risks as possible onto external parties.
- Distribute as little of the return to our risk-sharing partners as possible.

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# The Power of NuSubsidies

- Pooling the power of licensing lobbies and more: [NuStart](#), [TVA-led](#), and [Dominion-led](#) initiatives.\*
- Financially strong:<sup>1</sup>
  - \$447 **billion** in revenues during 2003 -- rivaling the entire Russian Federation and beating the *combined* GDP of 104 different countries!
  - 8 members among the world's 500 largest global corporations (GE is number 9).
  - 3 additional members among 500 largest in the US; one among the biggest US private firms.
  - 3 members are governments.
- Politically-savvy:
  - Of our 11 US-based private sector members, six were among the [highest donors](#) to the 2004 election cycle for energy/natural resources sector.
  - Two (GE and Southern) are amongst the [top 100 donors](#) since 1989 to politicians.
- Our team can make pigs fly!

\*See Technical Notes page for more on NNC.

# NuSubsidy Strong: Revenues

Corporation	Ticker	New Licensing Affiliation	2003 Revenues (\$Bils)
<a href="#">Atomic Energy of Canada</a>	Government	Dominion thru 1/05; now independent	0.4
<a href="#">Bechtel</a>	Private	Dominion, TVA	16.3
Constellation Energy Group	<a href="#">CEG</a>	NuStart	9.7
Dominion Resources	<a href="#">D</a>	<a href="#">Dominion</a>	12.1
Duke Energy Corp.	<a href="#">DUK</a>	NuStart	22.2
<a href="#">EDF International North America*</a>		NuStart	50.8
Entergy	<a href="#">ETR</a>	NuStart	9.2
Exelon**	<a href="#">EXC</a>	<a href="#">NuStart</a>	15.8
Florida Power and Light*	<a href="#">FPL</a>	NuStart	9.6
General Electric	<a href="#">GE</a>	NuStart, TVA, Dominion	134.2
Hitachi***	<a href="#">HIT</a>	Dominion thru 1/05; now independent	82.0
Progress Energy	<a href="#">PGN</a>	NuStart	8.7
Southern Company	<a href="#">SO</a>	NuStart	11.3
<a href="#">Tennessee Valley Authority</a>	Government	NuStart, TVA	7.0
<a href="#">Toshiba</a>	TOSBF.PK	<a href="#">TVA</a>	52.6
Uranium Enrichment Corporation	<a href="#">USU</a>	TVA	1.5
<a href="#">Westinghouse/British Nuclear Fuels</a>		NuStart	4.1
<b>Total NuSubsidies Members 2003 Revenues</b>			<b>447.3</b>
*Revenues for the EDF Group and the FPL Group respectively.			
**Exelon revenues will jump to \$27 billion per year after merger with PSEG.			
***FY ending March 2004.			
Sources: <i>Linked sources include corporate financial reports and filings compiled by Yahoo! Finance.</i>			

# NuSubsidy Strong: Size

Corporation	Global 500 Rank 2003 Revenues (1)	US 500 Rank 2003 Revenues (2)	2003 Profits	Profits (\$mils)	US Private Rank 2004 Revenues (3)
Atomic Energy of Canada (govt)					
Bechtel (private)					5
Constellation Energy Group		203	289	\$ 277	
Dominion Resources	449	164	263	\$ 318	
Duke Energy Corporation	204	75	489	\$ (1,323)	
Electricite de France	61				
Entergy		217	119	\$ 951	
Exelon	333	126	124	\$ 905	
Florida Power and Light (FPL Group)		205	128	\$ 890	
General Electric	9	5	3	\$ 15,002	
Hitachi	23				
Progress Energy		224	143	\$ 782	
Southern Company	486	178	78	\$ 1,474	
Tennessee Valley Authority (govt)					
Toshiba	64				
Uranium Enrichment Corporation					
Westinghouse/British Nuclear Fuels					
<b>Sources</b>					
(1)	"World's Largest Corporations: Fortune Global 5 Hundred Ranking," <u>Fortune</u> , July 26, 2004, p. 163.				
(2)	"Fortune 500 Largest U.S. Corporations," <u>Fortune</u> , April 5, 2004, pp. F-1 - F-21.				
(3)	"Forbes Lists: Largest Private Companies," <u>Forbes</u> , accessed from www.forbes.com on 1/31/2005.				

# NuSubsidy Strong: Countries We Beat

	Annual revenues, 2003, NuSubsidy Members	\$ 447.3 billion	
	<b>2003 Gross Domestic Product of:</b>		
	Brazil	\$ 492.3	15th largest national economy in the world
	Russian Federation	\$ 433.5	16th largest national economy in the world
	Switzerland	\$ 309.5	17th largest national economy in the world
	104 lowest GDP nations tracked by the World Bank	\$ 432.3	
<p>Albania; Angola; Antigua and Barbuda; Armenia; Aruba; Azerbaijan; Bahamas, The; Bahrain; Barbados; Belize ; Benin; Bhutan; Bolivia; Bosnia and Herzegovina; Botswana; Burkina Faso; Burundi; Cambodia; Cameroon; Cape Verde; Central African Republic; Chad; Comoros; Congo, Dem. Rep.; Congo, Rep.; Cote d'Ivoire; Cyprus; Djibouti; Dominica ; El Salvador; Equatorial Guinea; Eritrea; Estonia; Ethiopia; Fiji; Gabon; Gambia, The; Georgia; Ghana; Grenada; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; Iceland; Jamaica; Jordan; Kenya; Kiribati; Kyrgyz Republic; Lao PDR; Latvia; Lesotho; Liberia; Macao, China; Macedonia, FYR; Madagascar; Malawi; Maldives; Mali; Malta; Marshall Islands; Mauritania; Mauritius; Micronesia, Fed. Sts.; Moldova; Mongolia; Mozambique; Namibia; Nepal; Nicaragua; Niger; Palau; Panama; Papua New Guinea; Paraguay; Rwanda; Samoa; Sao Tome &amp; Principe; Senegal; Seychelles; Sierra Leone; Solomon Islands; St. Kitts and Nevis; St. Lucia; St. Vincent and The Grenadines; Suriname; Swaziland; Tajikistan; Tanzania; Timor-Leste; Togo; Tonga; Trinidad and Tobago; Turkmenistan; Uganda; Uruguay; Uzbekistan; Vanuatu; West Bank and Gaza; Yemen, Rep.; Zambia; Zimbabwe</p>			
<p>Source: "Total GDP 2003," World Bank Development Indicators database, World Bank, September 2004.</p>			

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# New products the conventional way

- Traditional firms invest their own funds to develop next-generation products.
  - These investments don't always pay off.
  - Failures harm investors and top executives.
- Example: Intel Chip Fabrication Plant Retrofit, Chandler, AZ
  - Cost: \$2 billion
  - Expected investment life: 10 years
  - Intel 2003 revenues: \$30.1 billion
  - Intel 2003 Global 500 Rank: 146



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# New products the NuSubsidy way

- NuSubsidy members have revenues nearly 15 times that of Intel.
- New nuclear plants expected to cost roughly the same amount as Intel spends to retrofit a single plant in its network.
- Nuclear plant life anticipated to be 40-60 years, 4-6 times as long as Intel's plant will be state-of-the art, and generating much lower annual capital costs.
- Clearly, our members could afford their own R&D, and to pay for their own new plants.
  - But, we don't like the risks to investors; and we want higher returns.
  - NuSubsidy helps its members go further faster: our work turns mediocre investments into no-lose scenarios for investors.
  - We call our more efficient model PEI, or "Policy-Enhanced Investing."

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# Policy-Enhanced Investing: NuSubsidy's Route to Higher Returns

- Core components of our strategy include:
  - Taxpayer finance of large portion of new product research and new facility licensing.
  - Taxpayer finance of large portion of new construction.
  - Shift risk of cost over-runs, poor demand for product to taxpayer.
  - Shift most liability for large accidents to taxpayer and to the surrounding population.
  - Shift technical and economic risks of radioactive waste disposal to the taxpayer.
  - Receive free carbon credits we can sell for profit, though we emit no carbon during power generation.
  - Retain all up-side benefits from successful plants for ourselves.
- The conditions for optimal PEI are fluid; our team is savvy and connected to use this flow to the advantage of our members.
- Results: faster payback to you; much lower risk to investment.

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# NuSubsidy Smart: New Product Development

- **Problem:** Investing in new products is expensive; many of the efforts fail.
- **NuSubsidy Solutions:** Federal funds for research and licensing; and federal plants. Our successes:
  - Between 1950 and 1993, our industry captured nearly 50% of all federal energy R&D spending -- \$51 billion less we had to fund ourselves.<sup>2</sup>
  - 1998-2003: fission share of R&D dropped to 20%, roughly \$250 million per year.<sup>3</sup>
    - New nuclear plants are venture capital level riskiness.
    - Still equivalent to an impressive 60% of venture capital investment in all energy technologies during that period, and with none of the borrowing costs.<sup>4</sup>
- We're working hard to push federal funding of our R&D up again, including federal development of new plants worth over \$1 billion.
  - Our members will build these as contractors.
  - If they make money, we'll work with our government partners on a good price to take them private.

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# NuSubsidy Smart: Plant Financing

- **Problem:** Nuclear plants cost more, take longer, and are more likely to be challenged by neighbors than most other energy sources. Power may be unneeded or uncompetitive by the time plant enters production.
- **NuSubsidy Solutions:** Shift risks to other parties
  - Production tax credit: every kWh we sell, another 1.8 cents goes off our taxes. Value to our industry is at least \$7 billion; possibly much higher.
  - Loan guarantees: a tax credit works only for plants that come on line; investors want protection even if we don't deliver. The benefits:
    - Ability to use less equity and more debt (which is cheaper).
    - Per-plant interest savings of \$40-\$75 million per year.<sup>5</sup>
  - Purchase agreements: government guarantees they'll buy the power when it comes on line at an (attractive) agreed upon price.
    - For NuSubsidy investors concerned our plants won't be needed, this is problem solved.
    - These may be instead of loan guarantees, but we're working to get both.

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# NuSubsidy Smart: Waste Not Want Not

- **Problem:** Our byproducts require monitoring.\* Our investors do not want this uncertainty.
- **NuSubsidy Solution:**
  - As Yucca mountain has demonstrated, political, technical, and economic challenges to long-term nuclear waste disposal are formidable.
  - Cost overruns and contingent liabilities would destroy the viability of new plants.
  - With existing plants, we transfer responsibility for the wastes to the US government in return for a small and predictable fee. If disposal is late, they pay us.
  - We're working to get this same deal for new plants, even if it requires the government to build additional repositories.

\*Actually, they need to be monitored for longer than most human societies have existed thus far on the planet.

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# NuSubsidy Smart: Accidents and Attacks

- **Problem:** Though we say it is impossible, plant neighbors and regulators continue to be concerned that utility defenses can be breached, generating an RDE.\* The issue creates cost and liability problems for our investors.
- **NuSubsidy solution:**
- Price-Anderson Act permanent extension.
  - This will cap investor exposure in the case of an RDE, with a value of well over \$300 million per year to members.
  - We are also working to reduce burdens under existing rules -- both by segregating each reactor into its own company, and by pushing for reduced coverage requirements for smaller reactors.
- Redefining Plant Security.
  - *Plant durability.* To counter historical engineering studies (now mostly removed from the public domain) that found our plants didn't do very well in the face of an airplane strike we've added a few touches of our own to challenge what remains.
  - *Value to the community.* We've worked hard to reclassify nuclear plants as national assets and treasures, rather than one way of many to make electricity that is also a big terrorist target.
    - We are working with the Department of Homeland Security and state and local government authorities to ensure they provide adequate funding to protect the safety of these treasures.
  - *Staff training.* A few critical studies aside, we have promoted how well trained and equipped our plant staff are to handle any crisis.

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\*Radioactivity Dispersion Event

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# NuSubsidy Clean: Cashing in on Carbon

- **Problem:** carbon trading scenarios may grandfather existing fossil fuel plant emissions. This would reduce the competitive gain to nuclear from regulating carbon.
- **NuSubsidy solution:** We are pushing hard to have all nuclear plants granted credits during the initial distribution.
  - Credits would be based on the amount of emissions we would emit if our plants actually used fossil fuel.
  - We can then immediately sell these credits to plants that do need to burn fossil fuels, for a quick return to our members.
  - This strategy has already been effective in New Hampshire for NO<sub>x</sub>.
    - We have high hopes for success in other venues, and for other emissions.
    - Returns could measure in the billions nationwide.

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# NuSubsidy Smart:

## We Can Make the Pigs Fly

- From basic research to enrichment, plant construction to waste disposal, NuSubsidies is working quietly to develop risk sharing partners for next generation plants.
  - Our partners may not even know they have become investors in our plants.
  - As a result, the financial cost of their participation is very low to our members.
- The ultimate result of these efforts will be nuclear reactors that are more profitable than even Archer Daniels Midland's ethanol business.
- NuSubsidy makes Policy-Enhanced Investing work for you.



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# Technical Notes

- **About NNC.** While the NuSubsidy Nuclear Consortium doesn't really exist, the three licensing consortia (NuStart, TVA-lead, and Dominion-lead) do. So too does the Nuclear Energy Institute, an industry-wide organization handling promotion and PR for nuclear power. All are working hard with other industry partners to bring as many of these risk-shifting strategies as they can to fruition.
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- **End Notes.**
  - [1] Financial strength measured by revenues at the conglomerate level. While tactical decisions about new investment or marketing are made at the divisional level, and constrained by divisional profits, major strategic decisions -- such as whether to build a new generation of nuclear plants in the US -- are made at the corporate level. Access to capital markets is also driven by overall strength of the corporation.
  - [2] Douglas Koplow, *Federal Energy Subsidies: Energy, Environmental, and Fiscal Impacts, Technical Appendix*, (Washington, DC: Alliance to Save Energy, 1993).
  - [3] U.S. Department of Energy, "Budget Authority by Appropriation" excel file, June 2003.
  - [4] PriceWaterhouseCoopers. *MoneyTree Survey of Venture Capital Investments*, 2004. Energy fraction of VC investments based on data compiled by Nth Power.
  - [5] Subsidy value of the loan guarantees equals plant debt x (private market interest rate - government bond rate). Using capitalized plant cost before financing of \$2.15b (Geoff Rothwell, Stanford, personal communication), 50% debt and 8% private market interest (MIT, *The Future of Nuclear Power*, 2003, p. 135) yields a 4% interest rate subsidy worth \$42 million per plant-year. The MIT study assumes the same cost of debt for nuclear plants as for coal and natural gas; this is unlikely in the absence of a sovereign guarantee. The high estimate uses a more realistic 9% cost of debt, plus a higher debt ratio of 70% (also possible due to the guarantees), yielding reduced interest payments of \$75m/plant-year.

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# For Further Reading

- Learn about [historical subsidies](#) to nuclear energy.
- Learn about current legislative efforts to subsidize nuclear energy.
  - [Pending proposals](#)
  - [HR6 Proposals](#) from last year
  - [Nuclear production tax credit](#)
  - [NRDC overview](#)
  - [Public Citizen Overview](#)
  - [Friends of the Earth Overview](#)

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