



# Century Fuels, Inc.

A Nuclear Technology Licensing and Fuel Supply Company founded on 40 years of R&D

*Cleaner, Greener, Safer and More Profitable Nuclear Power*





## World Energy Today -- \$2 Trillion Market

- **Petroleum**
- **Gas**
- **Electricity**
- **Coal**
- **Alternative Energy**
- **Nuclear**

### The Challenge:

- **Pollution**
- **Rising Energy Prices**
- **Increasing Demand**
- **Energy Security**
- **Climate Change**





## Standard & Poor's Assessment of Electrical Generation Costs

	Pulverized Coal	Gas (CCT)	IGCC (Eastern Coal)	IGCC (PRB Coal)	Wind	Nuclear	Nuclear/Thorium DBI Estimate	Concentrated Solar Power KV** Estimate	Enhan. Geo. System KV** Estimate
Capital Cost (\$/Kw)	2,438	700	2,795	2,925	1,700*	4,000	1,967	3,000	4,000
Total Cost (cents/KWh)	5.8	6.8	6.8	6.5	7.1*		5.5	7-11	5-10
CO2 Capture Cost (\$/Kw)	940	470	450	450	0	0	0	0	0
Cost for Carbon Capture & Storage (Cents/KWh)	6.2	2.8	3.4	3.6	0	0	0	0	0
<b>Cents/KWh</b>	12.0	9.6	10.2	10.1	7.1	8.9	5.5	7-11	5-10
<b>Cents/KWh (credits \$30)</b>	7.9	7.7	8.7	8.4	7.1	9.1	5.7	7-11	5-10

\* S&P notes that there are disadvantages with wind that are not explicitly modeled – high transmission costs (because wind has limited availability), low capacity factor (30-35%), and unpredictability (leading to greater need for back/up power) and limit wind from serving as a base-load power source. “Which Power Generation Technologies Will Take The Lead in Response To Carbon Controls?”, S&P Viewpoint, May 11, 2007.

\*\* Khosla Ventures Estimate



## The Nuclear Opportunity

“Nuclear energy is the only realistic alternative to fossil fuels that has the capacity to both fulfill the large scale energy needs of mankind while also reducing greenhouse gas emissions.”

- James Lovelock, PhD

Nuclear offers:

- Clean and green: no greenhouse gas emissions
- Reduced reliance on fossil fuels: eliminates dependence on oil cartels
- Low and predictable O&M costs
- High capacity factors
- Long operating life cycles



## Company Overview

### Business Model

Sell *Licenses (Royalties)* for Thorium Nuclear Breeder Reactors

Sell *Proprietary Fuel* for Thorium Nuclear Breeder Reactors

### Management Team

Hector A. D'Auvergne, Chairman & CTO, **40 Years Research Thorium Nuclear Reactors, Over 56 US Patents & Patents Pending, 22 Related to this Project**

William M. Prevost, President & CEO, **20 Years General Electric, 10 Years Westinghouse**

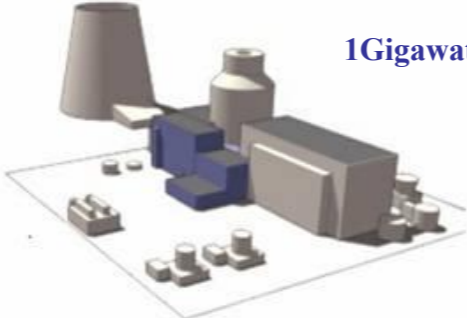
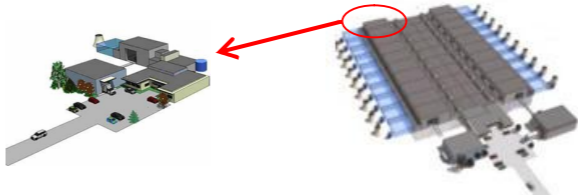
Alfred V. Larrenaga, EVP & CFO, **InVision, Southwall Tech., Harris and Arthur Anderson**

Dr. Kenneth N. Ricci, PhD, VP, Senior Physicist, **Stanford, MIT**

Dr. Amerigo J. Biollo, DC., VP, Business Development, **Boeing, Private Practice**



## Small, Safer & Low Cost DBI Thorium Modules *Allows More Customers who Produce Revenue Faster*

Conventional Nuclear Reactor	DBI Thorium Reactor
<p>Large, Complex Plant</p> <ul style="list-style-type: none"> <li>• Large Customers</li> <li>• Capital Required: <b>(1.1 GW \$1.9 Billion)</b></li> <li>• Revenue Path: <b>5 years +</b></li> <li>• High Pressure Design: <b>2000 PSI</b></li> </ul>	<p>Small, Simple and Modular Design</p> <ul style="list-style-type: none"> <li>• Large and Small Customers</li> <li>• Capital Required <b>(50 MWe \$70 Million)</b></li> <li>• Revenue Path: <b>12 to 18 months</b></li> <li>• Low Pressure Design: <b>200 PSI</b></li> </ul>
<p style="text-align: center;"><b>1Gigawatt Plant</b></p> 	<p style="text-align: center;"><b>50MWe Plant      1Gigawatt Plant</b></p> 

The construction time using “factory assembled” modules for DBI larger nuclear plants when optimized to achieve short construction times, is estimated at an equivalent 2 or 3 years of carrying cost versus 7 years of carrying cost for a large plant, i.e. 1.1 Gigawatt made up of twenty-two DBI 50 MW<sub>e</sub> versus a 1.1 Gigawatt single unit LWR.



## Lower Nuclear Costs

Conventional Nuclear	DBI Thorium
Costs: <ul style="list-style-type: none"> <li>• Higher Cost of Capital</li> <li>• Higher O&amp;M costs</li> <li>• Fuel Costs: volatile and high</li> </ul>	Costs: <ul style="list-style-type: none"> <li>• <b>20%</b> Capital Cost Reduction</li> <li>• <b>25%</b> O&amp;M expense reduction</li> <li>• <b>77%</b> Fuel Cost reduction over 60 year lifecycle</li> </ul>

1.1 Gigawatt Power Plant	Westinghouse "AP 1000"	~ 22 DBI Thorium 50 Megawatt Modules
	Dollars	Dollars
Total Capital	\$ 1,847,400,264	\$ 1,468,788,249
Operation & Maintenance Per Year	\$ 119,144,209	\$ 87,922,424
Average Fuel Cost Per Year	\$ 89,013,783	\$ 20,246,518



## Thorium Reactor Value

- Quantitative

Reduction in Radioactive Waste.....	<u>90%</u>
Savings in Nuclear Fuel Cost* .....	<u>95%</u>
Profit Improvement .....	<u>150%</u>

- Qualitative

Proliferation Resistant.....	<b>Priceless!</b>
Energy Independence (gas/electricity).....	<b>Priceless!</b>
No Greenhouse Gases** .....	<b>Better than Priceless!</b>

\* Includes 8% Carrying Costs

\*\* **Carbon Credits**



Small Modular Design Also Allows Existing  
Coal, Petroleum and Gas Plants To  
*Meet Emerging Carbon CAP Requirements*

Existing 350 MWe (1050 MWt) Coal-fired Electric Power Plant



DBI 150 MWt Steam Module



In Existing 350 MWe (1050 MWt) Plant By  
Replacing 150 MWt Of Steam With One DBI  
150 MWt Steam Module Reduce Greenhouse  
Emissions By:

**14.25%**



## Target Markets

Market Segments	2007 Revenues (trillions)	2007 TAM (billions)	2007 SAM (billions)
Wholesale Electricity	\$1.00	\$157.4	\$78.7
Alternative Fuel	\$0.50	\$78.7	\$39.3
Hydrogen for Agriculture	\$0.07	\$10.9	\$5.4
<b>Total</b>	<b>\$1.57</b>	<b>\$246.9</b>	<b>\$123.5</b>

- **Total available market (TAM) derived from royalties, fuels sales and one time fees.**
- **Served available market (SAM) is 50% of TAM.**



## License and Fuel Revenues From Power Plant Owner/Operators

	Non-Recurring	Recurring
<p><b>One Time License Fee To Build A Thorium Reactor Using DBI Intellectual Property: Engineering Specifications</b></p> <p><b>\$2500 / MWe</b></p>	✓	
<p><b>Monthly Revenue License on Wholesale Price of Electricity (WPOE) Using DBI Intellectual Property: Process &amp; Trade Secrets</b></p> <p><b>8% of WPOE Royalty</b></p>		Monthly
<p><b>One Time Fuel Sales for "Seed" Uranium Recurring Fuel Sales For Thorium Every Eighteen Months Using DBI Intellectual Property: Proprietary Fuels (Built By Others)</b></p> <p><b>Fuel Sales at Market Value</b></p>		Every 18 Months



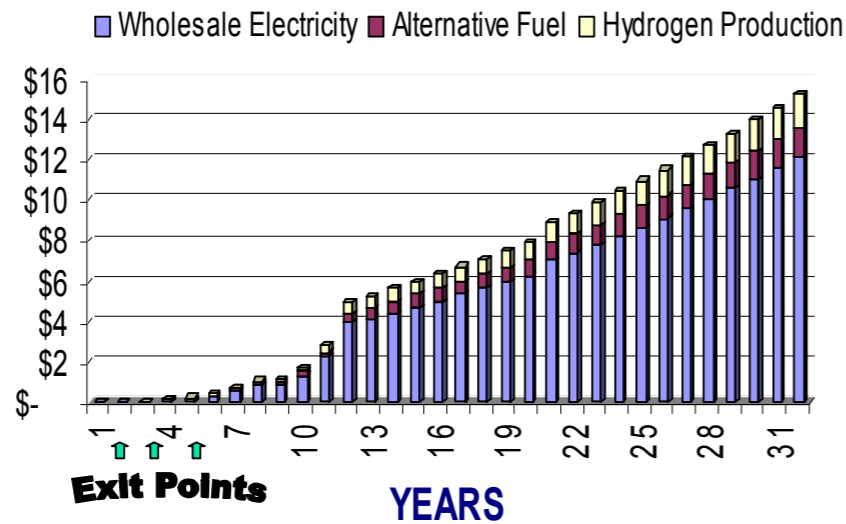
## Share Of Market

Market Segments	DBI Share of Market as % of Served Available Market			
	2008 SOM	2018 SOM	2028 SOM	2038 SOM
Wholesale Electricity	0.0%	0.9%	3.5%	5.1%
Alternative Fuel	0.0%	0.2%	0.9%	1.3%
Hydrogen for Agriculture	0.0%	1.8%	7.0%	10.2%

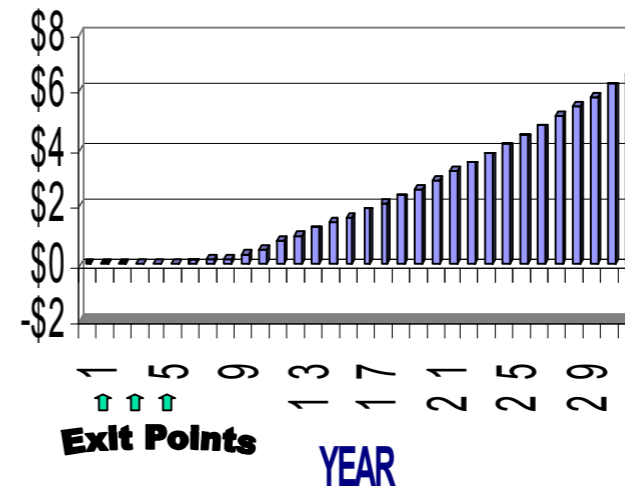


## Revenue and Free Cash Flow (after all costs and taxes)

**Revenue \$billions**



**FREE CASH FLOW \$billions**

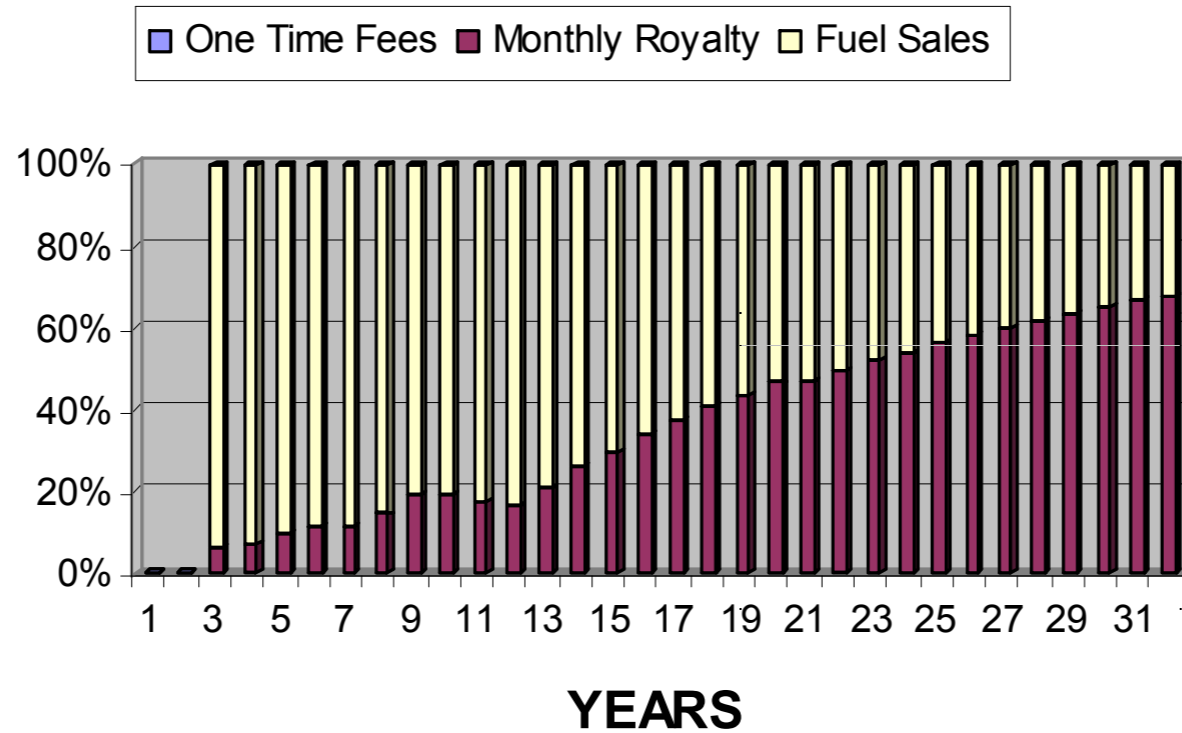


Exit Points: BHP Biliton, Rio Tinto, Cameco, AREVA, Exelon, GE, IPO



## License and Fuel Revenues % Over Time

### Revenue %





## Why now?

### Market Drivers

- Global Climate Change
  - An Inconvenient Truth: Increased Awareness
  - Kyoto Protocol/Rising CO<sub>2</sub> emissions: 380ppm and rising
- Energy Security
  - OPEC
  - Petrodollar Authoritarian Regimes and Nuclear Ambitions
- Volatile Energy Costs
  - Spot Market Uranium Fuel (U308) Increase 1200% from 2000
  - Oil at \$100+ per barrel

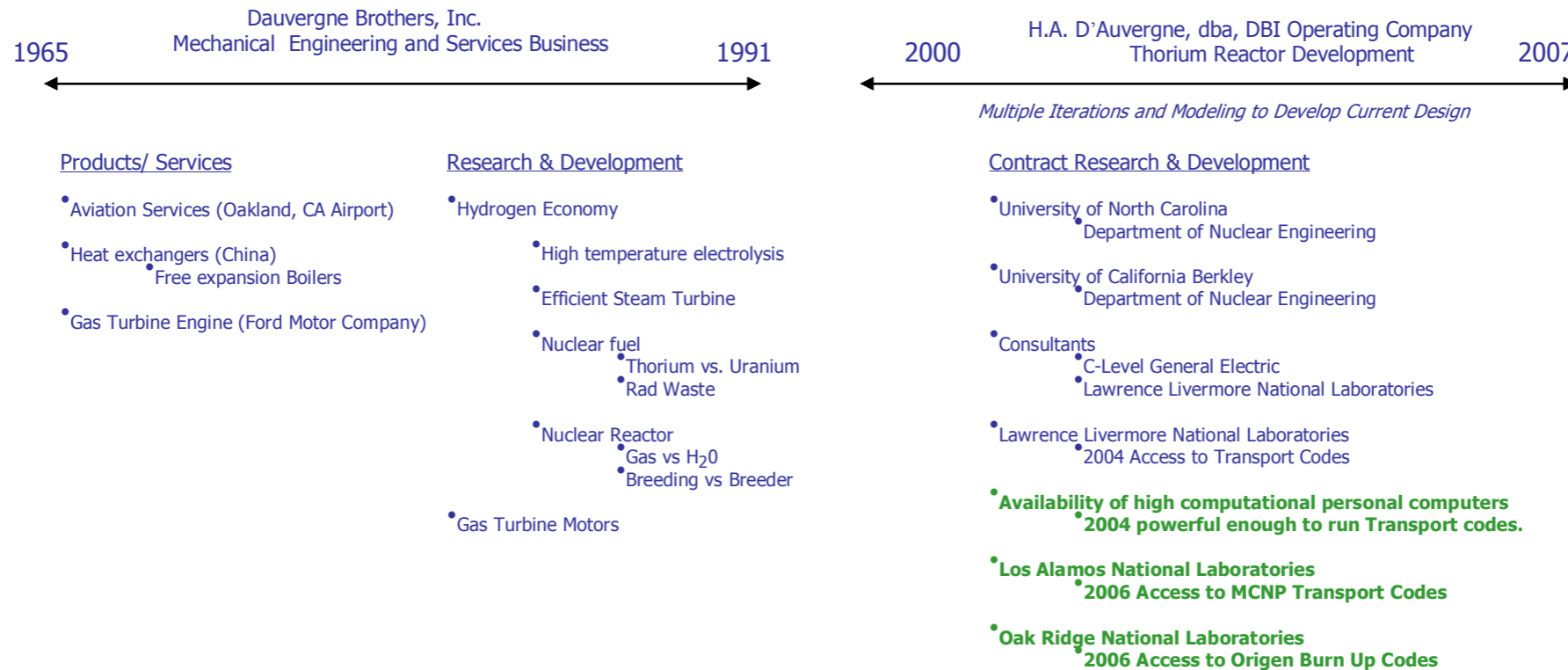
### Technology Drivers

- **Reduced Cost of Advanced Computational Computers**
- **Availability of DOE Transport Codes**



# Thorium Reactor Technology Development

## 40 Years of Innovation on a small, modular, gas-cooled, carbon moderated, Thorium Breeder Reactor





## Use of First \$5 million in Proceeds

### Initiate Demonstration Project: A small, modular, gas-cooled, carbon moderated, thorium reactor in Republic of Chile

2008

DBI, Century Fuels, Inc. - Thorium Technology Licensing Company

2009

#### Intellectual Property (Patents & Process Secrets)

- Nuclear Fuel
  - Encapsulation
  - Shuffling Algorithm
  - Replacement Encapsulation
- Nuclear Reactor
  - Low Cost (Off the Shelf)
  - Low Pressure
  - Low Temperature
  - Gas Cooled
  - Small Size
  - Factory Assembled
  - Short Construction
    - Fast to Revenue
    - Less Capital at Risk
    - Less Carrying Cost
  - Low Carbon
  - Scalable
  - Secure

#### Establish Company

- Consolidate IP
- Complete / Finalize Physics (MCNP and Origen)
  - **Four (4) years of modeling is complete**
  - Six (6) months to finish
- Customer Chile
  - **Letter of Intent**
  - Negotiate/ Sign Contract
  - Support Cooperation Agreement-123
  - Support Establishing Regulatory Agencies

#### Engineering Specifications, Detail Engineering Quotes, and Build Quotes

- Core Container
- Graphite Bricks
- Ceramic Insert
- Zirconium Insert
- Encapsulation Facility
- Lid w/Rail
- Crane w/Rail
- Ducting and Manifolds
- Particle Control
- Sand Wall
- Castings
- Drum Control
- Control Drum Pillows
- Drum Rotation Drivers
- CO2 Pumps (8)
- Gas to Water Heat Exchangers (4)
- LOCA Water Pumps (6) Pressurization System
- Valving Systems
- Sensors
- Control Computers w/SW
- Crane Control Room
- Crane Robotics/Electronics
- Safety, Risk Analysis

• Insurance

• Equipment Transportation

CONFIDENTIAL & PROPRIETARY

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## Eliminates Plutonium Production for Weapons

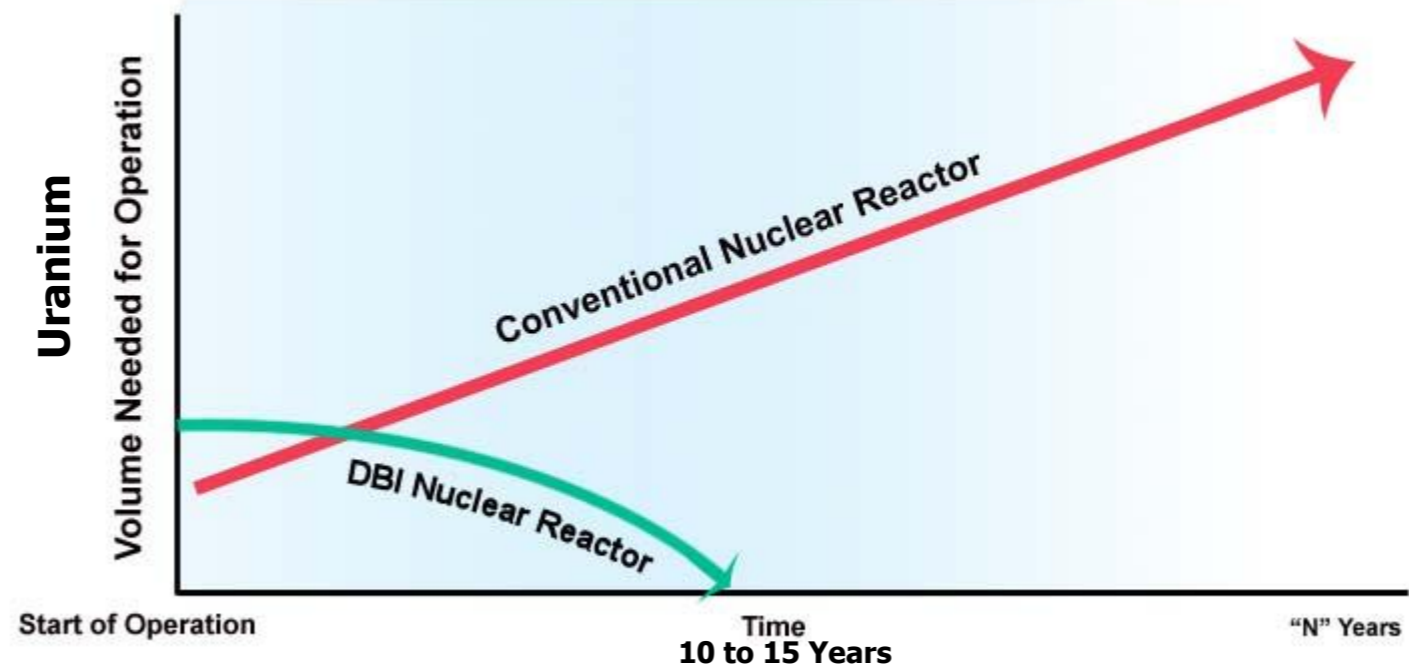
**Proliferation Resistant: No Plutonium (Pu) for Weapons of Mass Destruction**

Conventional Nuclear Reactor	DBI Thorium Reactor
Nuclear Proliferation: Plutonium ${}_{92}^{238}\text{U} + {}_0^1\text{n} \rightarrow {}_{92}^{239}\text{U} \rightarrow {}_{94}^{239}\text{Pu}$	Nuclear Proliferation Resistant: Thorium ${}_{90}^{232}\text{Th} + {}_0^1\text{n} \rightarrow {}_{90}^{233}\text{Th} \rightarrow {}_{92}^{233}\text{U}$



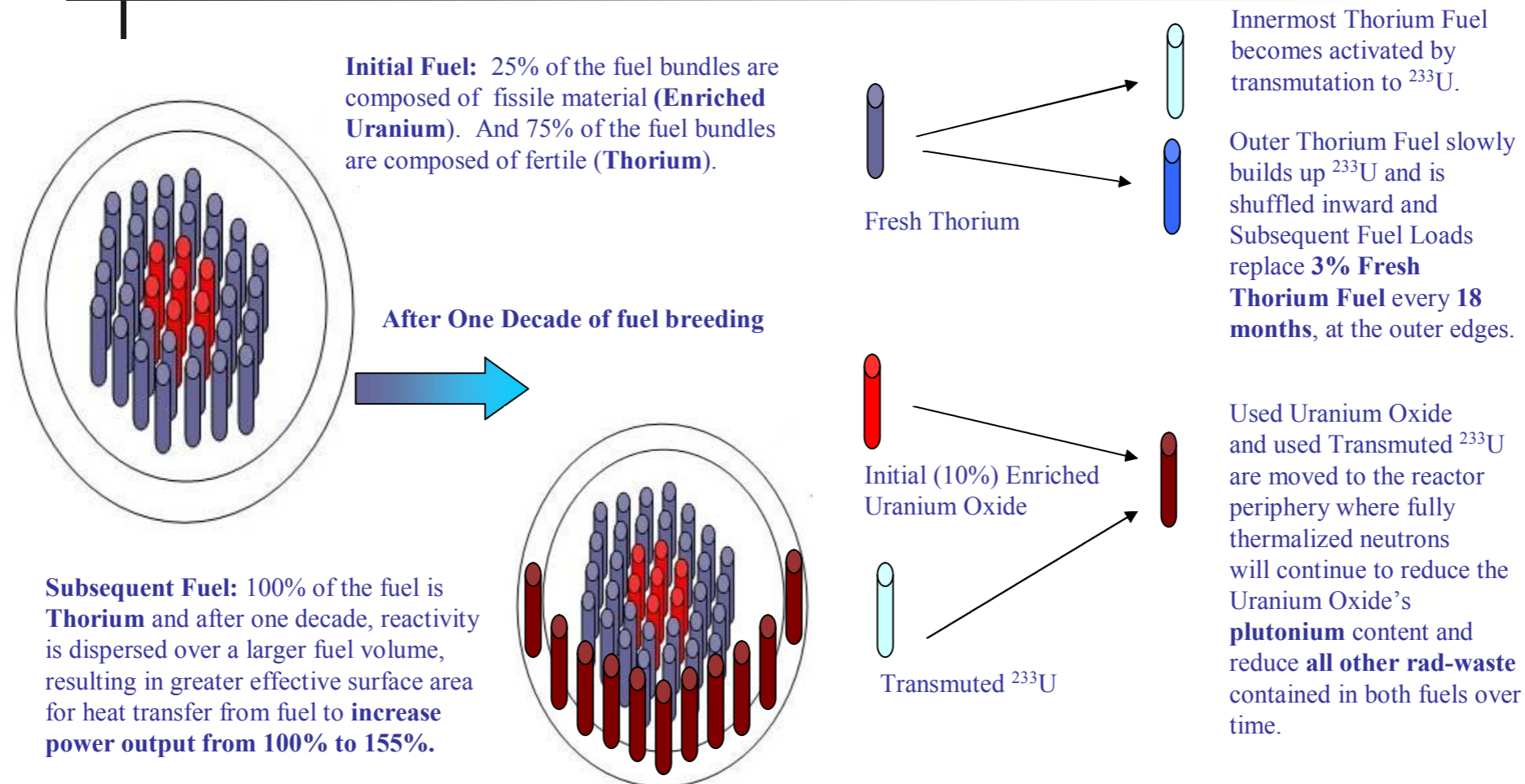
## Eliminates Need for Uranium Over Time

Conventional Nuclear Reactor		DBI Thorium Reactor	
• Initial load:	100%(3.5%E) Uranium	• Initial load:	25%(10%E) Uranium    75% Thorium
• Subsequent load:	33%(5.0%E) Uranium	• Subsequent load:	0% Uranium    3% Thorium





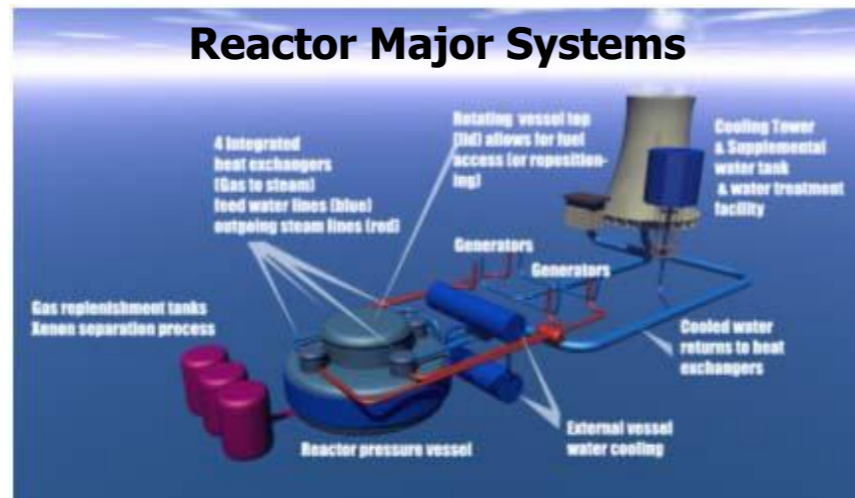
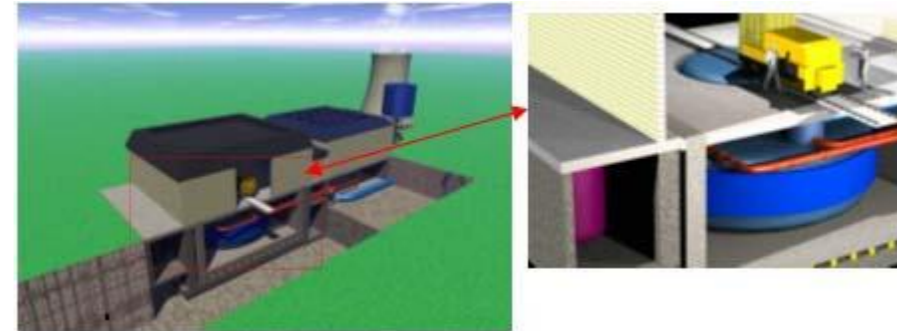
## Output Power Increases from 100% to 155%.





## Reactor Images

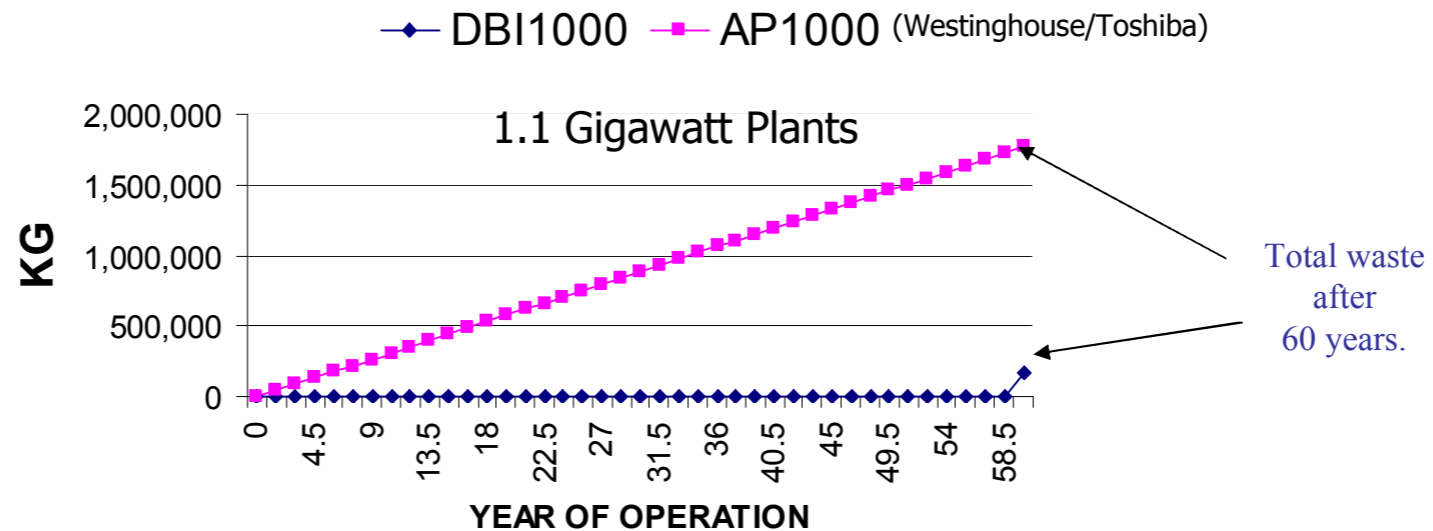
### Automatic Fuel Management (AFM)





## Reduces Radioactive Waste

Conventional Nuclear	DBI Thorium
Radioactive Waste: Business as Usual	Radioactive Waste: 90% Reduction



- Westinghouse/Toshiba Radwaste is removed from reactor every 18 months and stored in cooling ponds - waiting for Yucca Mountain.
- DBI Radwaste is stored in situ in the reactor until decommissioning - **no Yucca Mountain depository required.**



## Thorium Abundance Allows Energy Independence

**Enough Thorium Reserves to Provide World's Energy Needs for More than 2500 Years**

**Dispersed  
Resource**



Country	Reserves (tonnes)
Australia	452,000
USA	400,000
Turkey	344,000
India	319,000
Venezuela	300,000
Brazil	221,000
Norway	132,000
Egypt	100,000
Russia	75,000
Greenland	54,000
Canada	44,000
South Africa	18,000
Other countries	33,000
<b>World total</b>	<b>2,492,000</b>

(economically extractable):

source: Geoscience Australia 2006 and OECD/NEA Red Book retrospective, 2006.



## Thorium Reduced Cost and Higher Profits

### Levelized Cost of Electricity (“LCOE”)

<b>1.1 Gigawatt Power Plant</b>	<b>Westinghouse "AP 1000"</b>	<b>~ 22 DBI Thorium 50 Megawatt Modules</b>
Wholesale Price of Electricity \$/kWh	\$ 0.0653	\$ 0.0653
Levelized Cost of Electricity \$ / kWh	\$ 0.0560	\$ 0.0423
Gross Profit \$ / kWh	\$ 0.0093	\$ 0.0230
<b>LCOE as % of AP1000</b>	<b>100 %</b>	<b>76 %</b>

**Profit Increase: 150%**



## Thorium Residual Fuel Value

Decommission Plant After 60 Years And Use Breed Fuel For New Reactors

<b>1.1 Gigawatt Power Plant</b>	<b>Westinghouse "AP 1000"</b>	<b>~ 22 DBI Thorium 50 Megawatt Modules</b>
	Dollars	Dollars
~ Residential Fuel Value	ZERO	\$ 1,121,333,809

Enough Residual Fuel to start a 1.7 Gigawatt New Plant



## 5 Year Financial Summary

(\$ 000s)

	Years					
	<u>#1</u>	<u>#2</u>	<u>#3</u>	<u>#4</u>	<u>#5</u>	<u>#20</u>
Revenues	\$ -	\$ -	\$24,320	\$123,222	\$228,480	\$7,953,713
Fees			80	395	710	14,209
Royalties			1,394	8,527	21,720	3,688,652
Fuel			22,846	114,300	206,050	4,250,852
Gross Margins	-	-	(2,935)	16,641	41,651	
Operating (loss) income	(6,109)	(14,163)	(14,403)	(250)	17,334	
Funding – External	20,000	10,000	5,000	-	-	
Net Cash Flow (before funding)	(9,100)	(18,828)	(2,730)	828	18,296	



## Use of Funding

**Demonstration Project: A small, modular, gas-cooled, carbon moderated, thorium reactor in Republic of Chile**

	(000s)	
	Year <u>1</u>	Year <u>2</u>
Operating Expenses, net	2,600	7,100
1 <sup>st</sup> Reactor - International	6,000	14,000
Regulatory Filings	<u>1,000</u>	<u>000</u>
	<b>\$ 9,600</b>	<b>\$21,100</b>

## Norte Grande Proposal





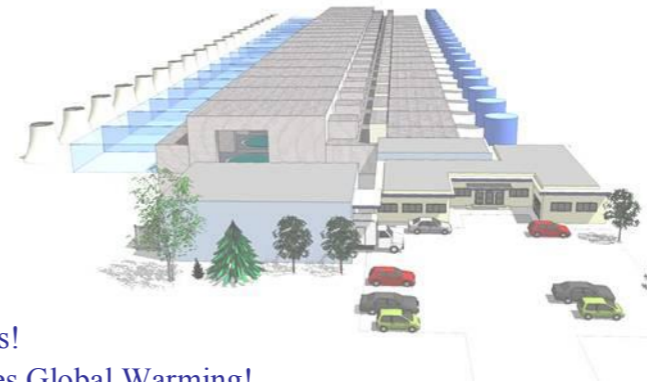
## Capital Structure

	<u>Shares (000s)</u>		
	<u>Outstanding</u>	<u>Post "A" Outstanding</u>	<u>%</u>
<b>Preferred:</b>			
Series "A"		5,013	19.1%
<b>Common:</b>			
Founders Stock	4,264	4,264	16.2%
Dauvergne (Transfer of Technology)	<u>16,999</u>	<u>16,999</u>	<u>64.7%</u>
	<b>Total</b>	<b>26,276</b>	<b>100%</b>



## Summary

- Intellectual Property
  - Trade Secrets
  - 22 ea. Patents Issued or in Process
- Design Benefits Highlights
  - Radioactive Waste Reduction ..... 90%
  - Fuel Savings ..... 95%
  - Customer Net Profit Improvement ..... 150%
  - Reduces Proliferation .....No Bombs!
  - No Greenhouse Gases .....Reduces Global Warming!
  - Energy Independence.....For Electricity And Gasoline!
- 15% DFCF (over 30 years) assuming gradual increase SOM..... \$4.6 Billion
- Cash Valuation of DFCF/15.....\$300 Million
- Series “A” Up to 5,013 shares .....\$35 Million
  - Post Series “ A” 26,276 Shares Outstanding.....\$7/share
- Demonstration Reactor Customer.....**Priceless!**





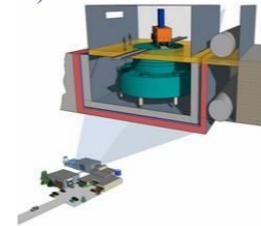


## Role in Energy Sector

### Provide Power Plant Owner/Operators (PPOO):

- PLANT INFRASTRUCTURE SPECIFICATIONS (AMERICAN CODES):

- To PPOO's Architectural Engineering Constructor  
To Detail Design and Build Power Plant Infrastructure



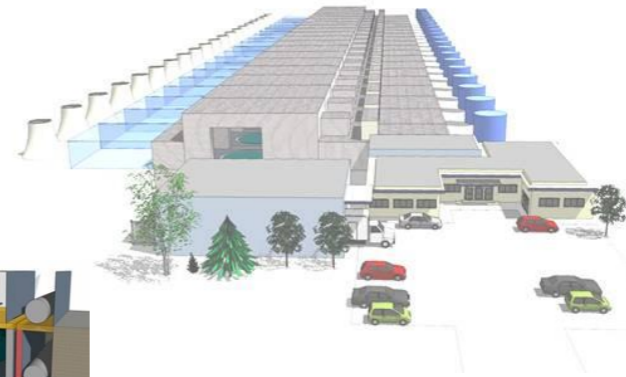
- CORE COMPONENT & CONTROL CONSTRUCTION & OPERATIONAL INSTRUCTIONS (AMERICAN CODES):

- To PPOO's Plant "Start-Up" Company then  
To PPOO For Operating Power Plant



- NUCLEAR FUEL

- To PPOO For Fueling the Plant





## In Process Issues

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- Materials Lifetime under Hard Neutron Irradiation Analysis
- Seismic and General Reactor Safety Analysis
- Reactor Control System Stability Analysis
- Fission Product Build-up Analysis



## Company Overview

### History

**1965** Dauvergne Brothers, Inc. founded by inventor Hector A. D’Auvergne.

**1997** DBI Operating Company, a.k.a. H.A.D.doing Research &  
**2007** Development to assemble technology.

**2008** DBI Century Fuels, Inc. incorporated to commercialize the technology, products and services developed by D’Auvergne.

**Mission** *To provide global markets with safe, clean, affordable, abundant, carbon-free energy for the power grid and fuel generation.*



## Personnel

### Founder, Mr. Hector A. D'Auvergne

Mr. D'Auvergne's background is documented in the curriculum vitae, showing his founding of the company in the 1960s, the beginning of his work on thorium fuel packaging in the 1970s, and the development of Free Expansion Boilers in the 1980s—all of which led to today's refined DBI Thorium Reactor designs.

### Executive Officer, Mr. William Prevost

Spent 20 years with General Electric in marketing and sales development department, the last five as director and 10 years with Westinghouse Electric as CEO of Westinghouse Security Electronics. Total of 14 years of experience as chief executive officer. Bachelor's Degree in Electrical Engineering, advanced studies in General and Financial Management.

### Financial Officer, Mr. Alfred Larrenaga

Over twenty-five years of experience as Vice President and CFO of public companies, including InVision Technologies, Southwall Technologies and IPAC, and private companies, including ArcSoft, Asyst Technologies and Vega Vista. Early career held positions at Harris and Arthur Andersen. Certified public accountant and holds a B.Sc. in accounting from Santa Clara University.

### Senior Physicist, Dr. Ken Ricci

Doctorate, Masters, and Bachelors Degrees in Physics, with several years as an industrial physicist and research scientist with a major governmental research center.

### Director of Procurement

Bachelor's Degree in Mechanical Engineering. Spent 10 years with Boeing in their engineering department. Also holds a Doctorate Degree in an unrelated field.

### Business Development

Bachelor's Degree in Aviation Business Administration, with 8 years of experience as a Licensed Stock Broker at Charles Schwab & Company.

### Procurement Specialist

Bachelor's Degree in Interdisciplinary Design in Industry, with minor degree in Engineering Technology. 25 years of engineering, marketing, and managerial experience.

### Senior Nuclear Engineer

Doctorate and Bachelors Degrees in Nuclear Engineering. Spent 16 years as a nuclear engineer with a major national government laboratory in fusion technology, radiological issues, and environmental and safety analyses.

### Senior Mechanical & Nuclear Engineer

Doctorate Degree in Mechanical Engineering, Masters Degree in Nuclear Engineering, Bachelors Degree in Physics. Spent 30 years with General Electric in its nuclear energy and aerospace divisions. Extensive experience working with the Dept. of Energy and its national laboratories, the Dept. of Defense, NASA and its technical centers, members of Congress, and Congressional staff.



## Personnel

### Executive Assistant

Bachelor's Degree in Economics, with 30 years of experience in small business ownership, journalism, and graphic design.

### Risk Analyst

Masters Degrees in Industrial Safety, Masters Degrees in Mechanical Engineering, and Masters Degrees in Nuclear Engineering. More than 20 years of experience in nuclear fission safety, energy technology safety, fusion experiment safety, and environmental and risk analysis for Lockheed Martin, Bechtel, and a major governmental laboratory.

### Emergency Procedure Specialist

Bachelors Degree in Chemical Engineering with experience in small business ownership. Background as a licensed reactor operator training instructor, and in writing nuclear power plant emergency procedures for Westinghouse, SUN Technical, and Exelon Nuclear.

### Civil Engineers

Specialists for 45 years in civil engineering, architectural and structural design, and land surveying.

### Ceramic Component Manufacturers

Specialists for 26 years in fused glass manufacturing that will lend itself to the production of high-temperature ceramics.

### Machinists

Specialists for about 50 years in industrial structural fabrication.

### Sensors and Controls

Specialists for about 30 years in the process control industry.

### Satellite Communications

Specialist for more than 30 years in data transmission, including satellite communications.

### Technical Drawings

Specialists for about 20 years in graphic design and technical drawings.

### Publication Design

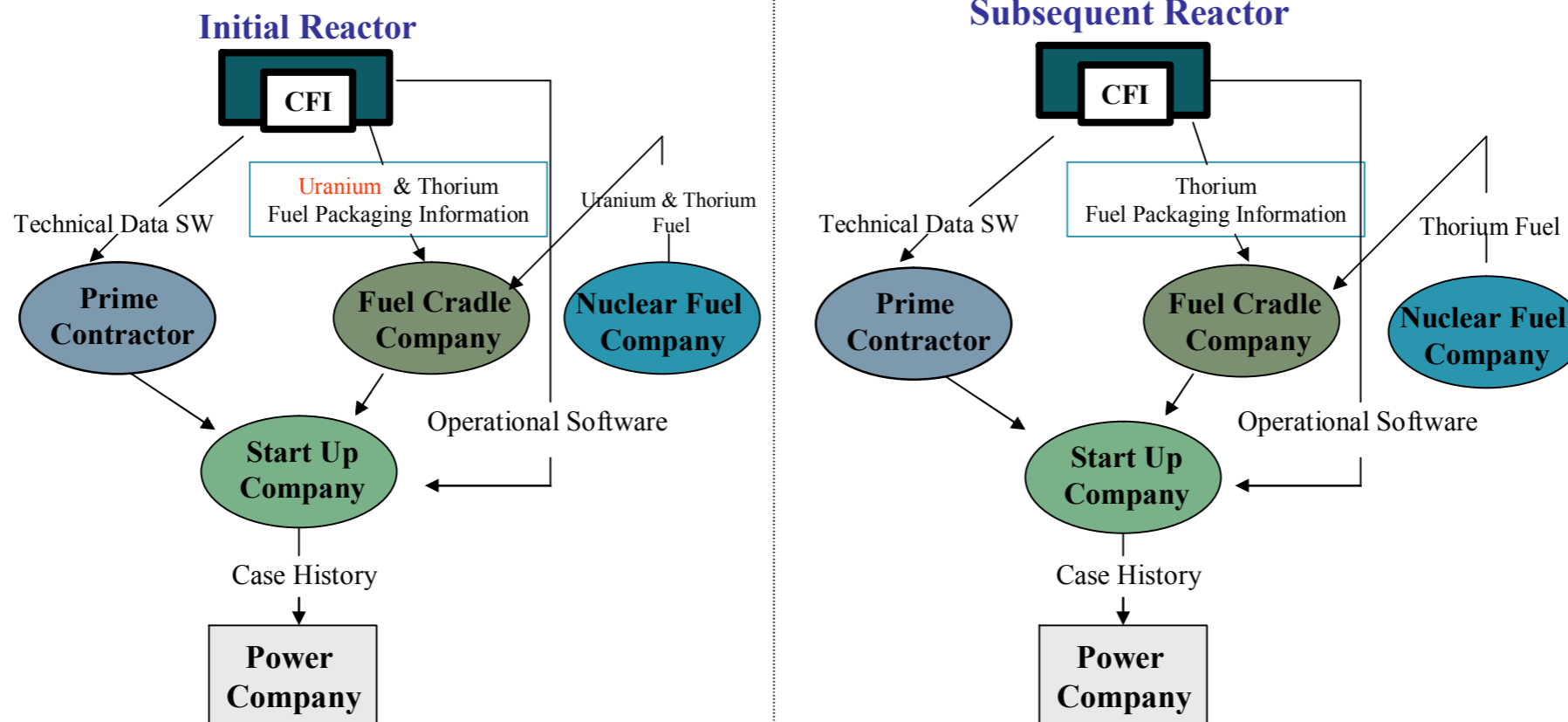
Specialists for about 20 years in multimedia and graphic design.

### Printing/Binding

Specialists for about 15 years in printing and binding.



## Technology & Products Implementation





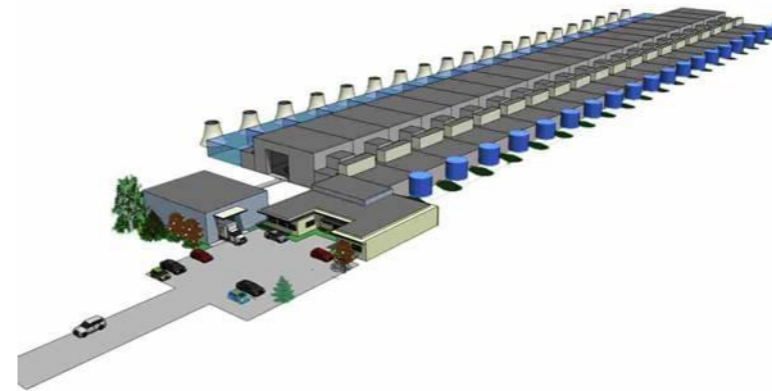
## Scaleable, Modular Design Serves All Applications

- Single 50 MWe Module or Twenty 50 MWe Modules

**50MWe Plant**



**1Gigawatt Plant**



Construction time for single 50 MWe NOAK module: 12 – 18 months (estimate)

Carrying cost for large plant consisting of 22 factory assembled modules: 2-3 years (vs. 7 years for an AP1000).



## Revenue & Security Management

- Satellite Remote Monitored System with Extensive Protections

