# AE-GREENPEACE. Yo soy antinuclear.
# Organizada por Greenpeace

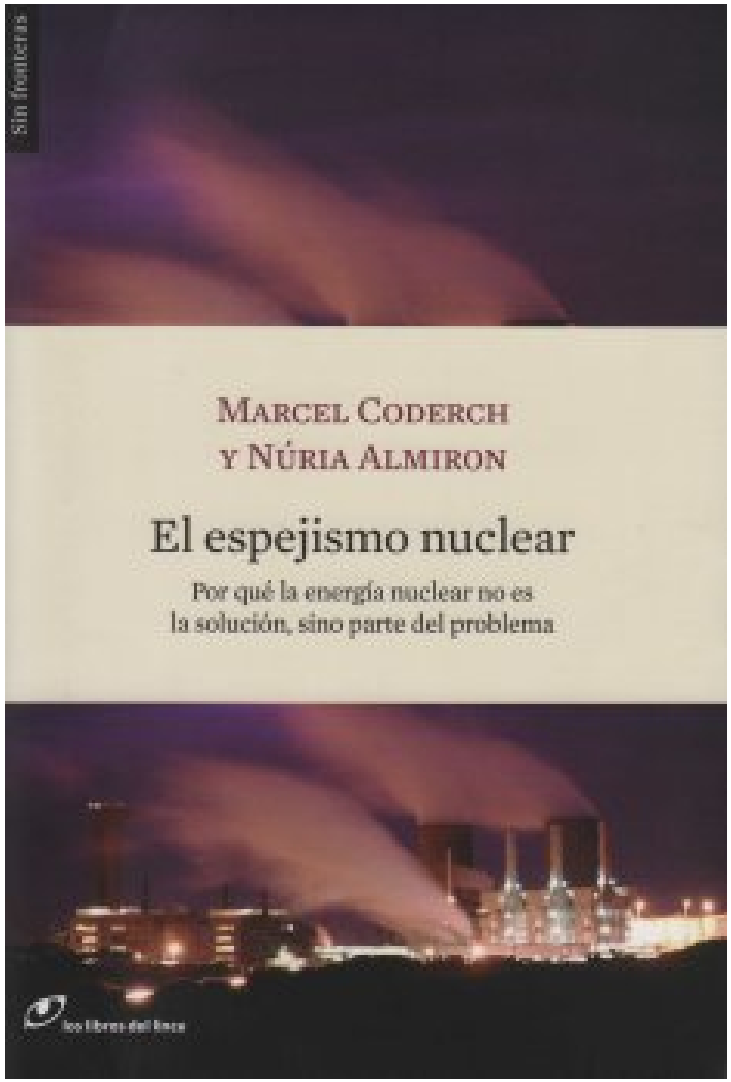
## THE NUCLEAR ILLUSION

Marcel Coderch Collell
Secretario
Asociación para el Estudio de Recursos Energéticos
(AEREN-ASPO Spain)

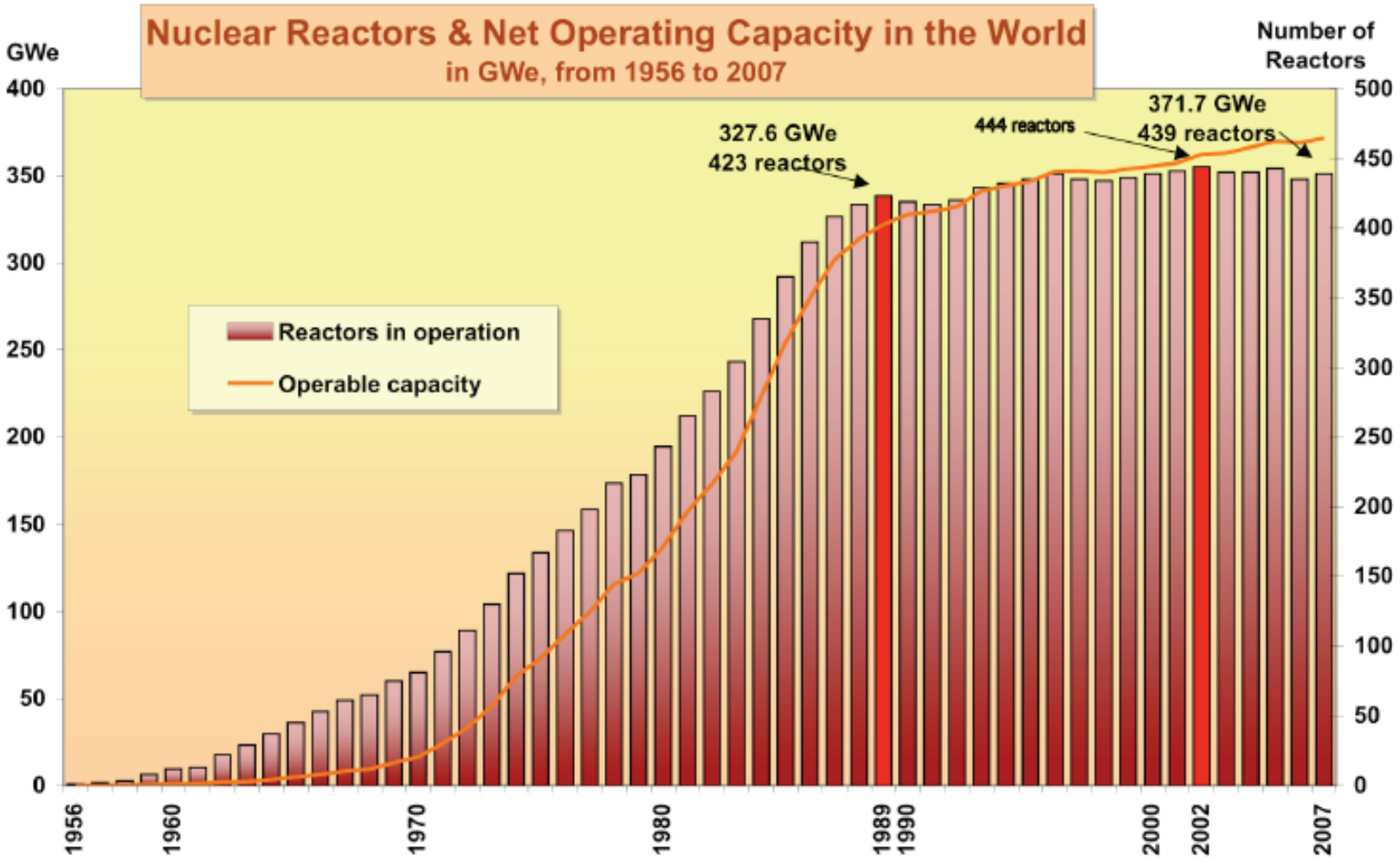
# The Nuclear Illusion

**CONAMA**
Madrid, 3 de diciembre, 2008

Marcel Coderch, Sustainable Development Commission of Catalonia

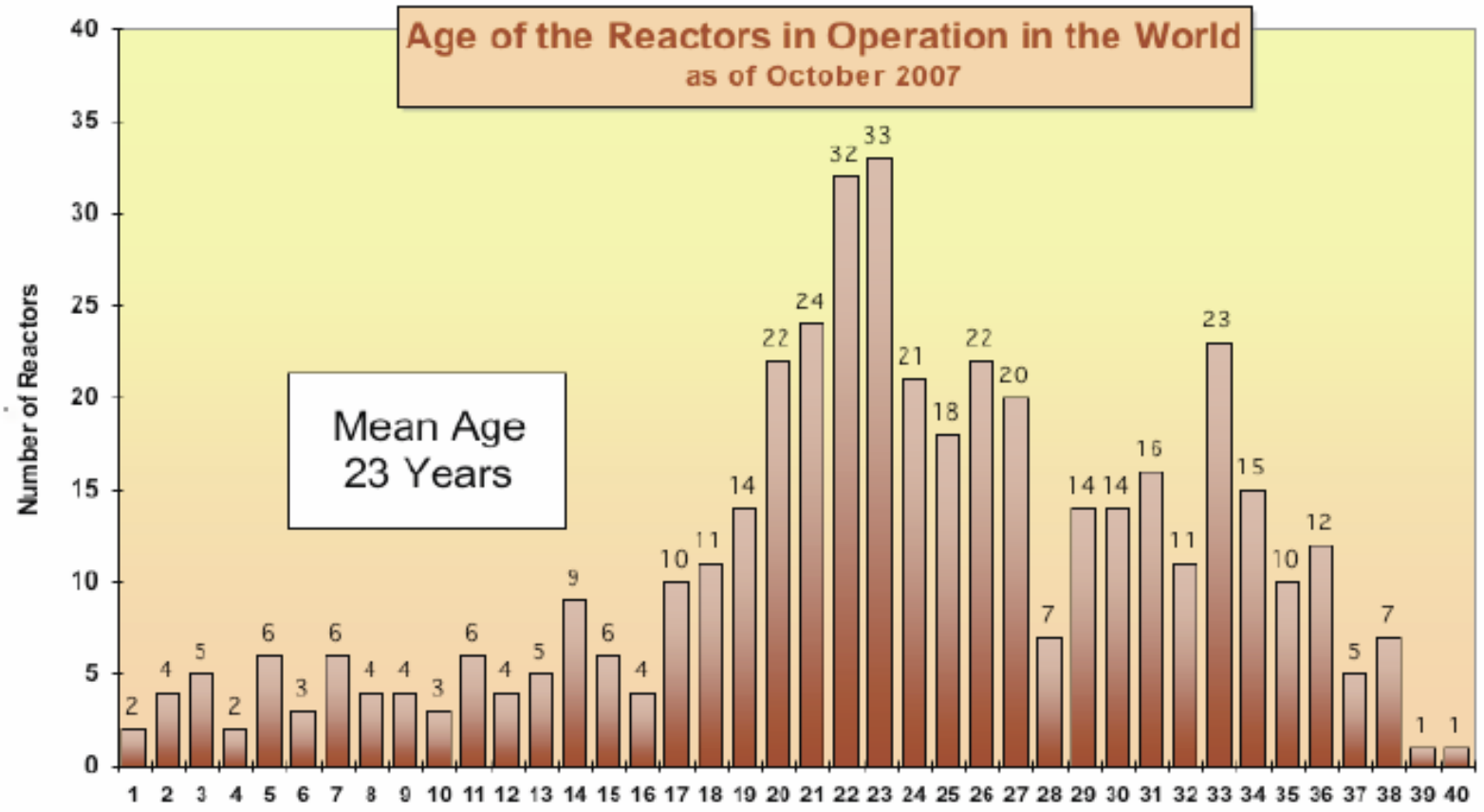

Sin fronteras
Marcel Coderch
y Núria Almiron
El espejismo nuclear
Por qué la energía nuclear no es
la solución, sino parte del problema
los libros del lince

# Net operating nuclear capacity




The Nuclear World Industry Status Report 2007 © Mycle Schneider Consulting *Source: IAEA, PRIS, 20072, MSC*

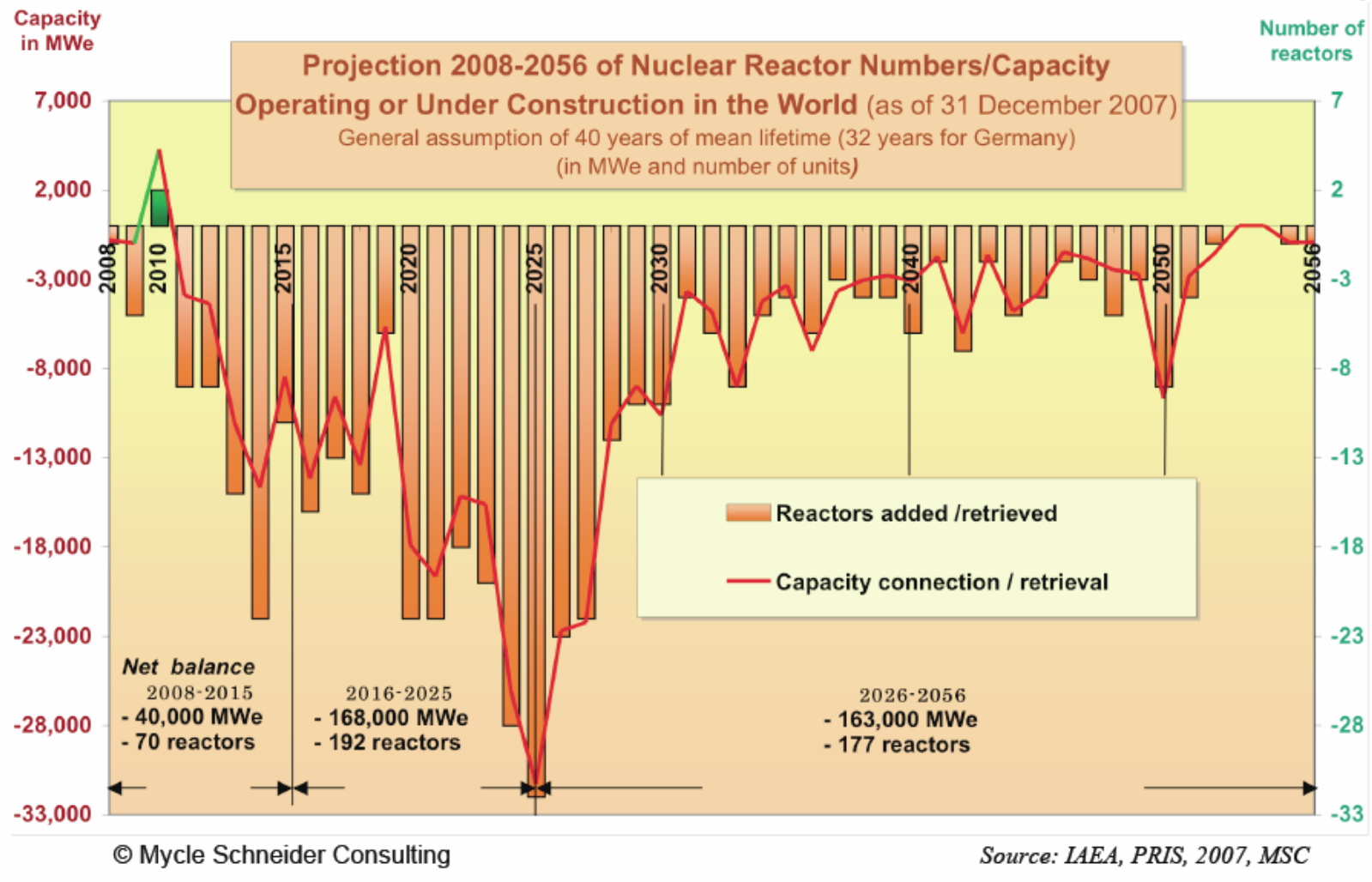
# Age of reactors in operation






*Source: IAEA, PRIS, 2007, MSC*

# Projection of net additions

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*Source: IAEA, PRIS, 2007, MSC*

# Five basic reasons for nuclear power

- High growth in energy demand is projected to 2030 and beyond.

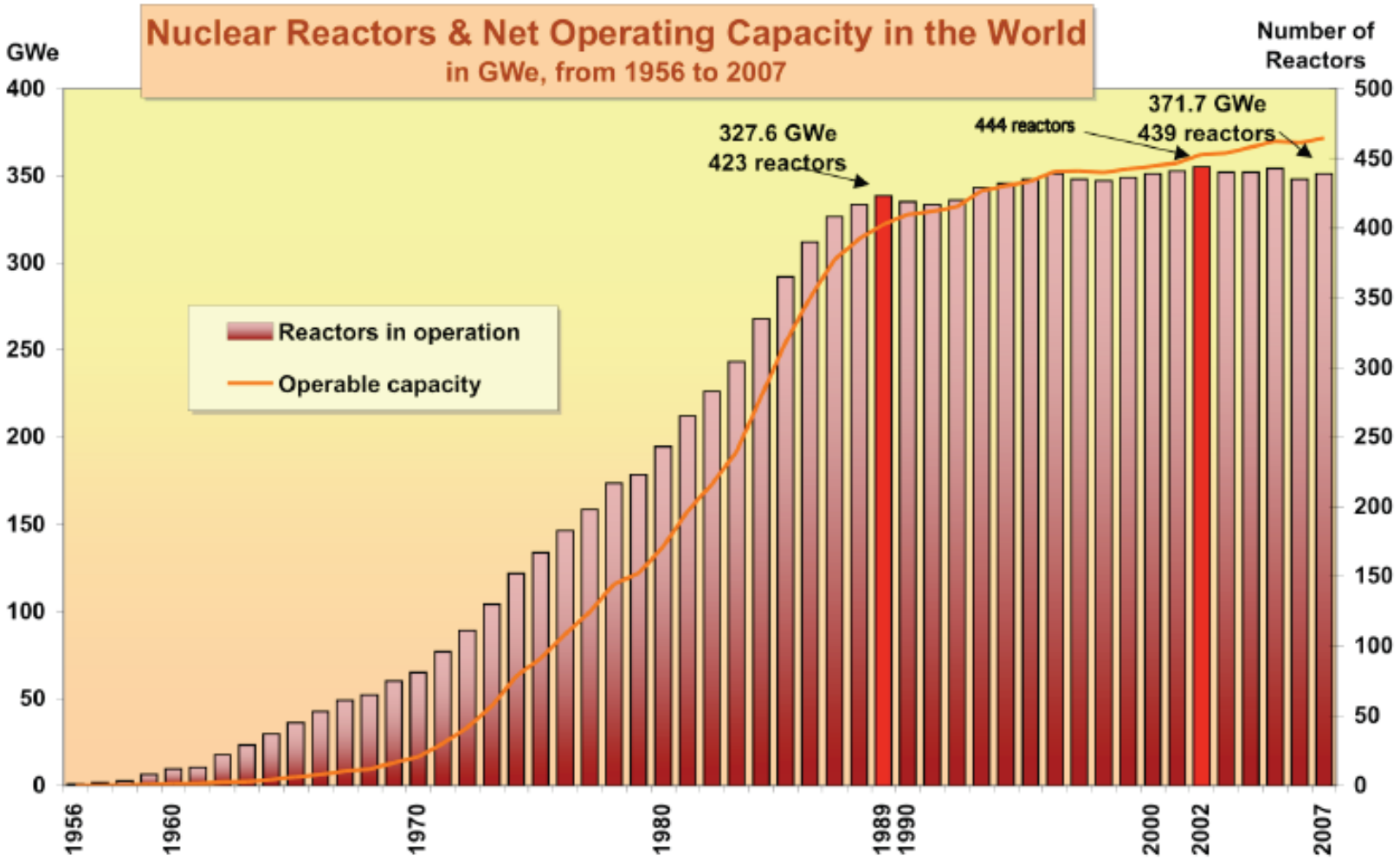
- Need for clean energy sources to mitigate climate change.

- Nuclear does not produce $CO_2$.

- High cost of fossils fuels: peak oil&gas.

- Energy independence.

# Nuclear as a response to 73' oil crisis

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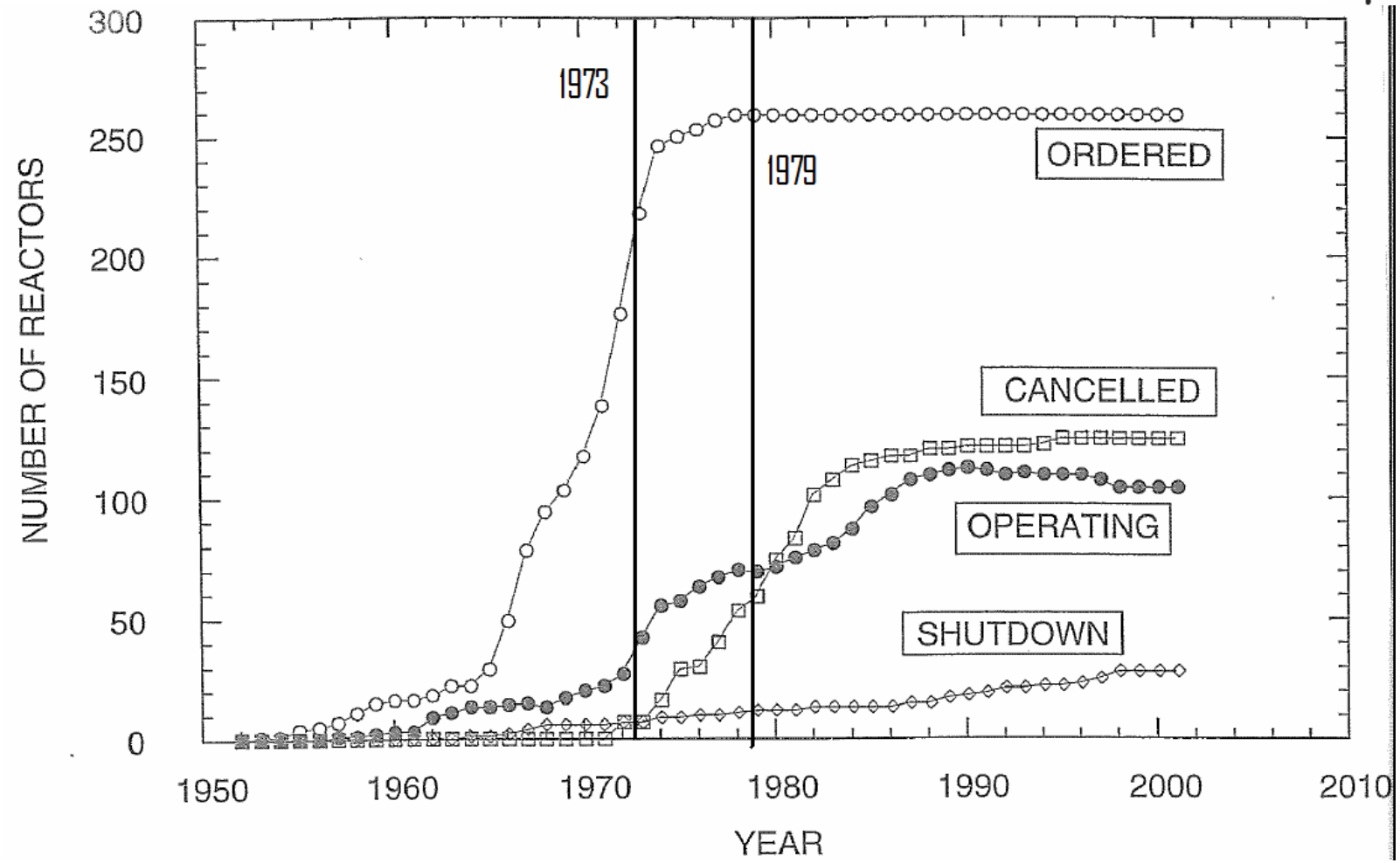
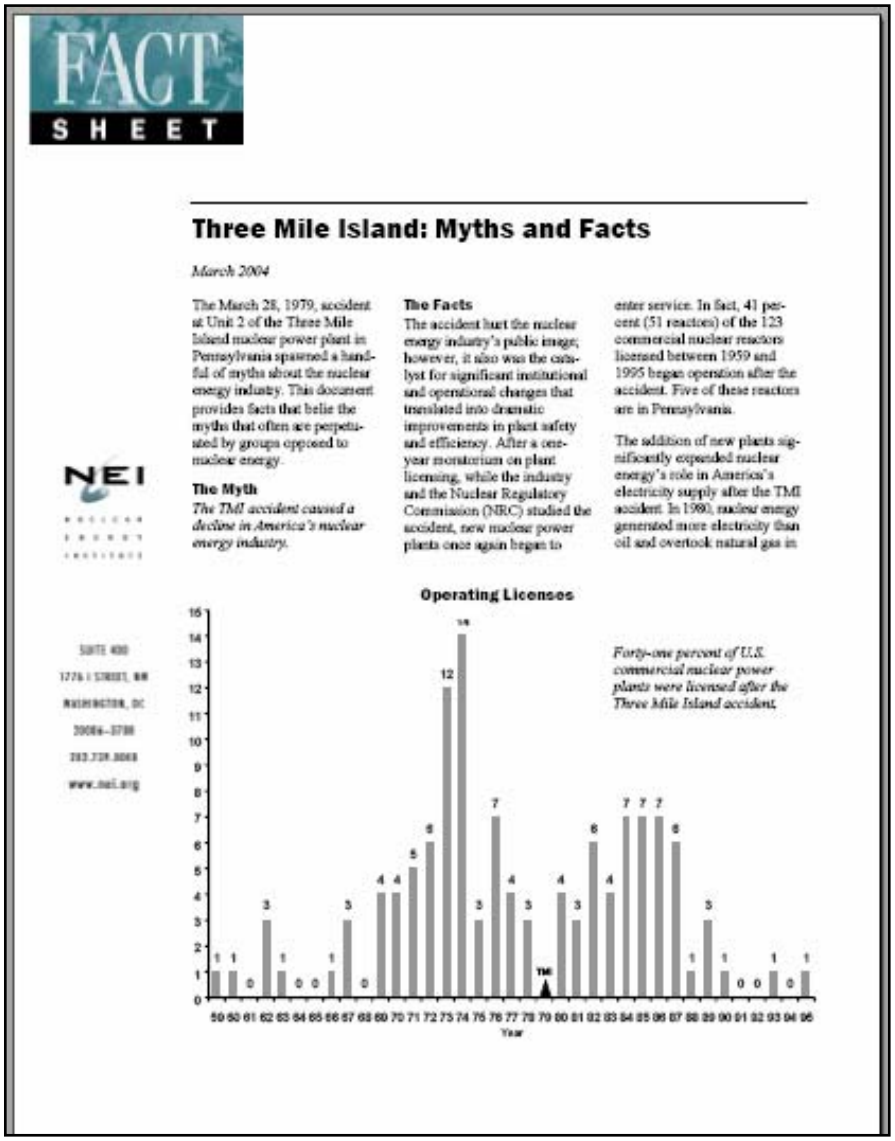
# What really happened ...




*Nuclear Energy: Principles, Practices and Prospects*, 2nd Ed., David Bodansky, Springer, 2004

# What the industry said ...



FACT SHEET

**Three Mile Island: Myths and Facts**

*March 2004*

The March 28, 1979, accident at Unit 2 of the Three Mile Island nuclear power plant in Pennsylvania spawned a handful of myths about the nuclear energy industry. This document provides facts that belie the myths that often are perpetuated by groups opposed to nuclear energy.

**The Myth**

*The TMI accident caused a decline in America's nuclear energy industry.*

**The Facts**

The accident hurt the nuclear energy industry's public image; however, it also was the catalyst for significant institutional and operational changes that translated into dramatic improvements in plant safety and efficiency. After a one-year moratorium on plant licensing, while the industry and the Nuclear Regulatory Commission (NRC) studied the accident, new nuclear power plants once again began to enter service. In fact, 41 percent (51 reactors) of the 123 commercial nuclear reactors licensed between 1959 and 1995 began operation after the accident. Five of these reactors are in Pennsylvania.

The addition of new plants significantly expanded nuclear energy's role in America's electricity supply after the TMI accident. In 1980, nuclear energy generated more electricity than oil and overtook natural gas in

NEI

**Operating Licenses**

*Forty-one percent of U.S. commercial nuclear power plants were licensed after the Three Mile Island accident.*

Most plant cancellations can be traced to the 1973 oil embargo, which led to high interest rates and low economic growth—and in turn halved growth in electricity demand from an average annual increase of 7 percent to less than 3 percent.

Nuclear Energy Institute

# What the industry says ...

**John Rowe**
**President and Chief Executive Officer, Exelon Corp**
**and Chairman of the Board, Nuclear Energy Institute**

**"Nuclear Energy 2008: State of the Industry"**
**Nuclear Energy Assembly,**

**Chicago**
**May 6, 2008**

**Remarks as prepared for delivery**

Many of our companies – mine included – are considering construction of the first new nuclear power plants in the United States in several decades.

We are doing so because the energy needs of our nation demand it.

The need for new baseload generating capacity is unmistakable.

The electric sector's dependence on natural gas exposes our customers to unacceptable price volatility, and our companies to political and regulatory stress.

Nuclear power is an essential part of any workable response to the climate change issue.

# What the industry says ...

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I am emotionally biased but economically objective about this.

Excellent progress has been made, but the renaissance is not yet here

I am 63 years old, and not likely to get rich from the next nuclear unit

And I know that we cannot afford to let ourselves be carried away on the enthusiasm of press releases.

We must not misjudge the challenges facing companies developing new nuclear projects.

We must create realistic expectations.

Realistic expectations about the "renaissance" of nuclear power suggest that it will unfold slowly over time

Perhaps four to eight new plants in commercial operation as early as 2016 or so.

If those first plants are working to schedule…

within budget estimates
without licensing difficulties
with continued public policy support,

A second wave could be under construction as the first wave reaches commercial operation.

# What the industry says ...

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No reactor vendor is offering solid price certainty. -- and even the rough preliminary estimates are increasing rapidly.

Nothing will chill the rebirth of nuclear power more quickly than finding ourselves 18 months into construction on a project and 18 months behind schedule.

We must acknowledge that new nuclear plants are high-cost, capital-intensive plants -- especially compared to the book equity or market capitalization of the companies building them.

These costs are daunting, by any measure, and clearly represent a financing challenge for the electric power industry.

Companies are not willing to bet the farm on the success or failure of a single project.

We need to find new and innovative ways to share the risks.

But we still face a challenge in turning the Department of Energy's loan guarantee program into a stable financing platform.

We have been encouraged by the recent staff additions to the DOE Loan Guarantee Office, and expect the solicitation for new nuclear plants to be issued soon.

However, we anticipate that the request for loan guarantee coverage will far exceed the limited authorization available.

Public policy on the issue of spent fuel also remains unsettled.

Yucca Mountain is stalled and there has been no progress on an alternative.

It is our responsibility, along with the federal government, to consider our legacy to future generations, and get this issue resolved.

# Olkiuloto is in trouble ...

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## Areva in talks with TVO over EPR delays

By Peggy Hollinger in Paris
Published: October 16 2008 23:34 | Last updated: October 16 2008 23:34

Areva is weighing the need for further delays to its flagship nuclear reactor in Finland, which could result in new provisions for a project already running two years behind schedule and an estimated €1.5bn ($2bn) over budget.

The French nuclear operator is in discussions with its Finnish utility client TVO over the need to adjust the timetable for the fourth time in two years on the world's biggest nuclear build project. This means that the new generation, heavy-duty EPR reactor might now not enter service until 2012, against an initial target of 2009 and will cost far more than the original estimate of €3bn.

# What would it take ...

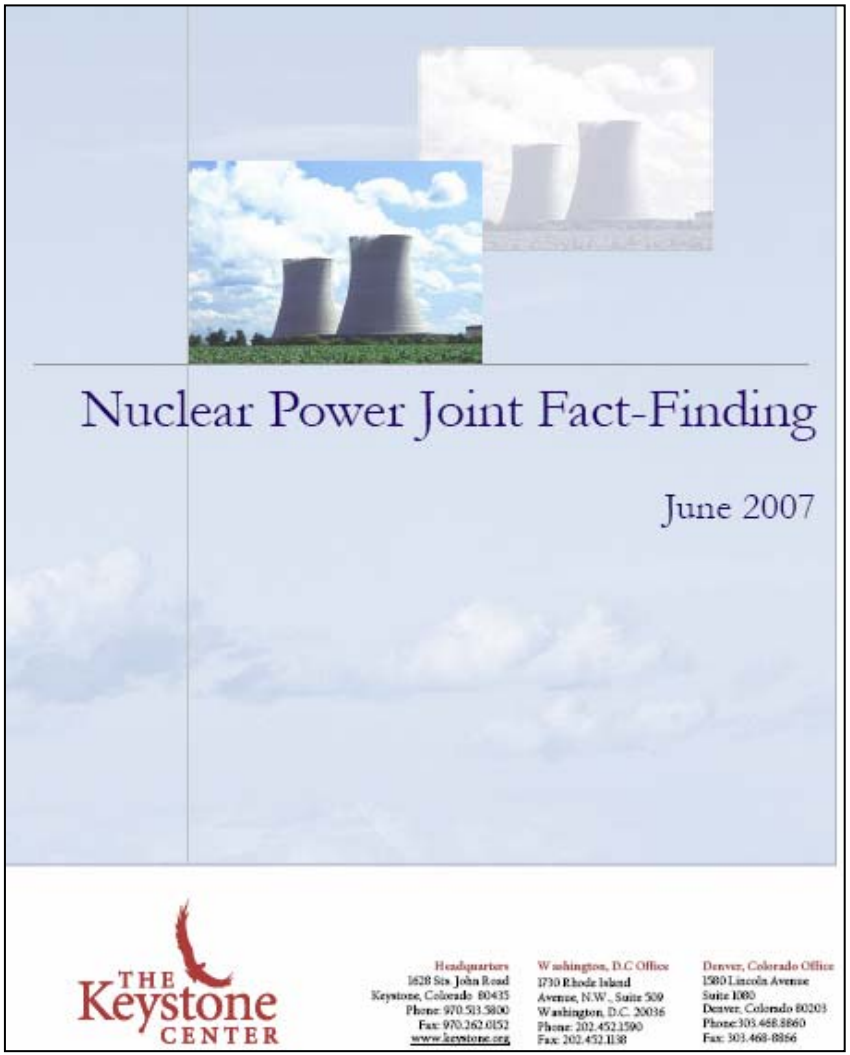
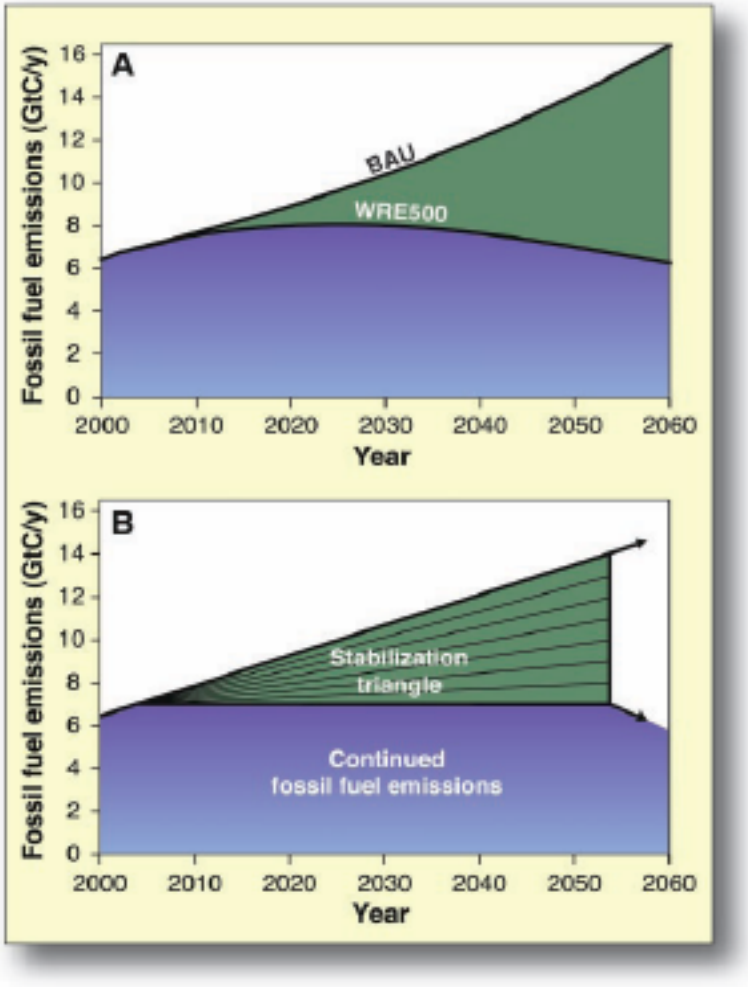



Figure 1. Pacala/Socolow Stabilization Wedge Concept



# What would it take ...

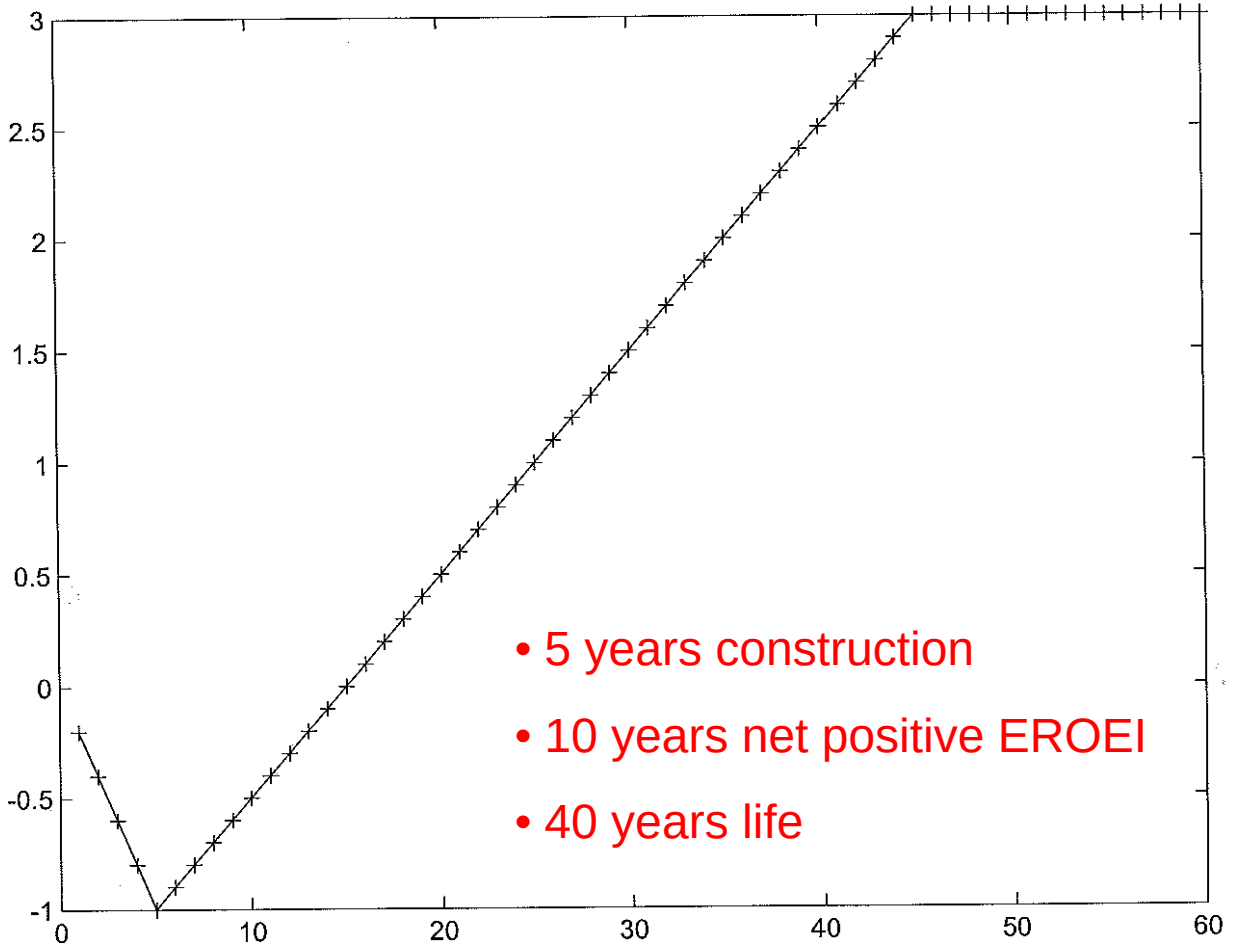
In their analysis, approximately 700 gigawatts-electric (GWe)[4] of new *net* nuclear capacity would be needed globally by the mid-2050s to achieve a wedge, assuming that this capacity would displace new, highly-efficient coal generation.[5] To add 700 GWe to current nuclear capacity world-wide over the next 50 years would require completing, on average, fourteen 1,000-megawatt-electric (MWe) plants each year.

Before 2050, however, it will also be necessary to replace retiring nuclear capacity (approximately 370 GWe) or to construct another 7.4 (1,000-MWe) reactors each year over the next 50 years. If we assume that the existing nuclear fleet is replaced over that 50-year period, then 1,070 GWe (about 21.4 GWe a year) must be built world-wide in order to yield a single climate-stabilization wedge while maintaining the low-carbon benefits of existing nuclear generation. Failure to replace the existing nuclear-plant fleet with new units, other low-carbon electric generation facilities, or energy efficiency improvements would effectively create a negative half-wedge or increase total emissions by 12.5 GtC over the next half century.

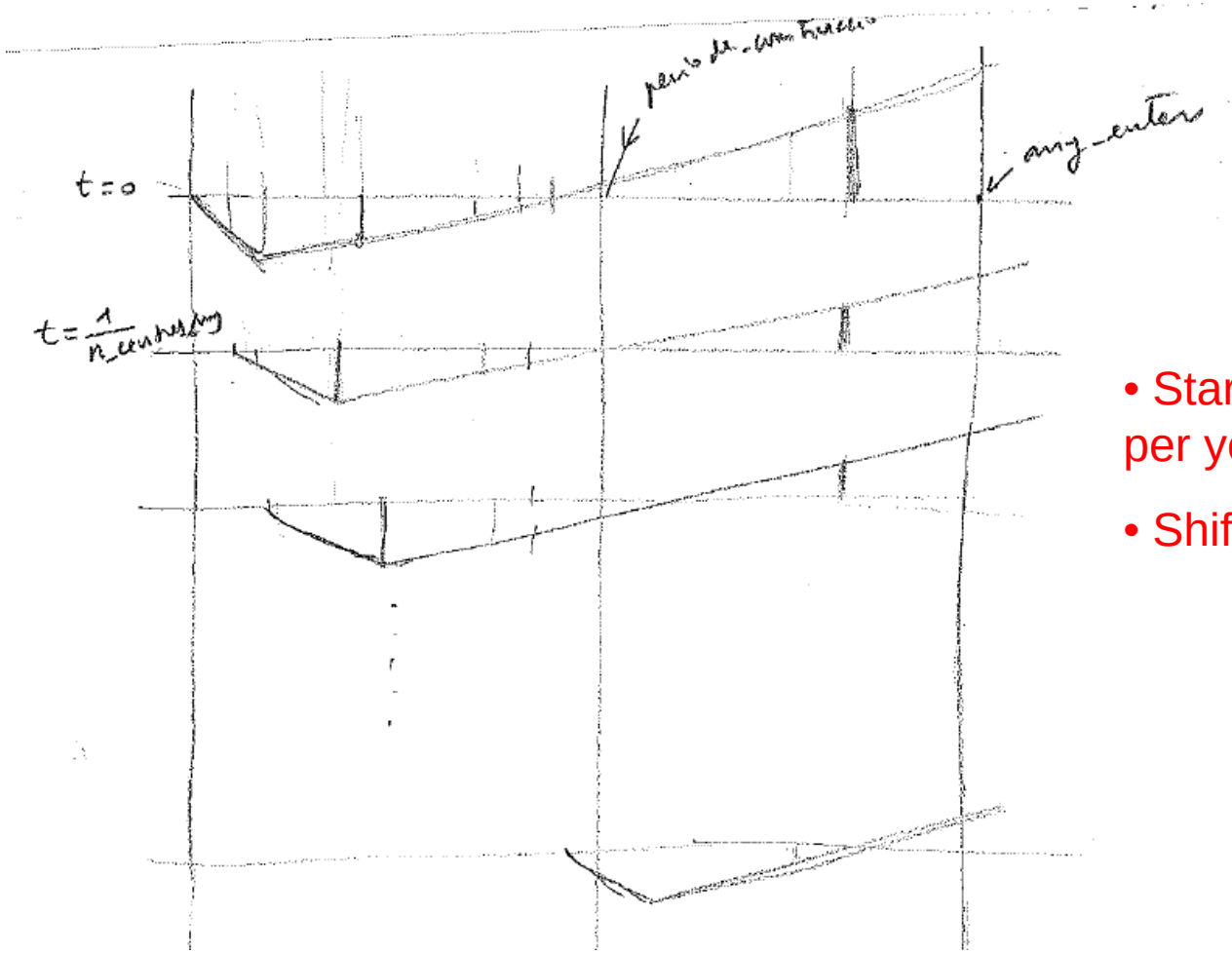
To meet the 700-GWe world-wide wedge plus replace the 370 GWe of existing capacity would also require substantial expansion of fuel-cycle facilities (e.g., uranium mines, mills, and enrichment plants, fuel fabrication plants, and nuclear waste repositories). The rough estimated capacity increase needed to meet fresh and spent fuel requirements for a 50-year ramp-up from 370 GWe to 1,070 GWe are:[8]

- 11-22 large enrichment plants, each yielding 4-8 million "kilogram separative work units per year" (kg SWU/y)[9] (compared to 17 existing plants);
- 18 fuel fabrication plants, each producing 1,000 tons of fuel per year (compared to 24 existing facilities world-wide); and
- 10 nuclear waste repositories the size of the statutory capacity of Yucca Mountain—713,000 tons of spent fuel.[10]

# Simple dynamic EROEI analysis

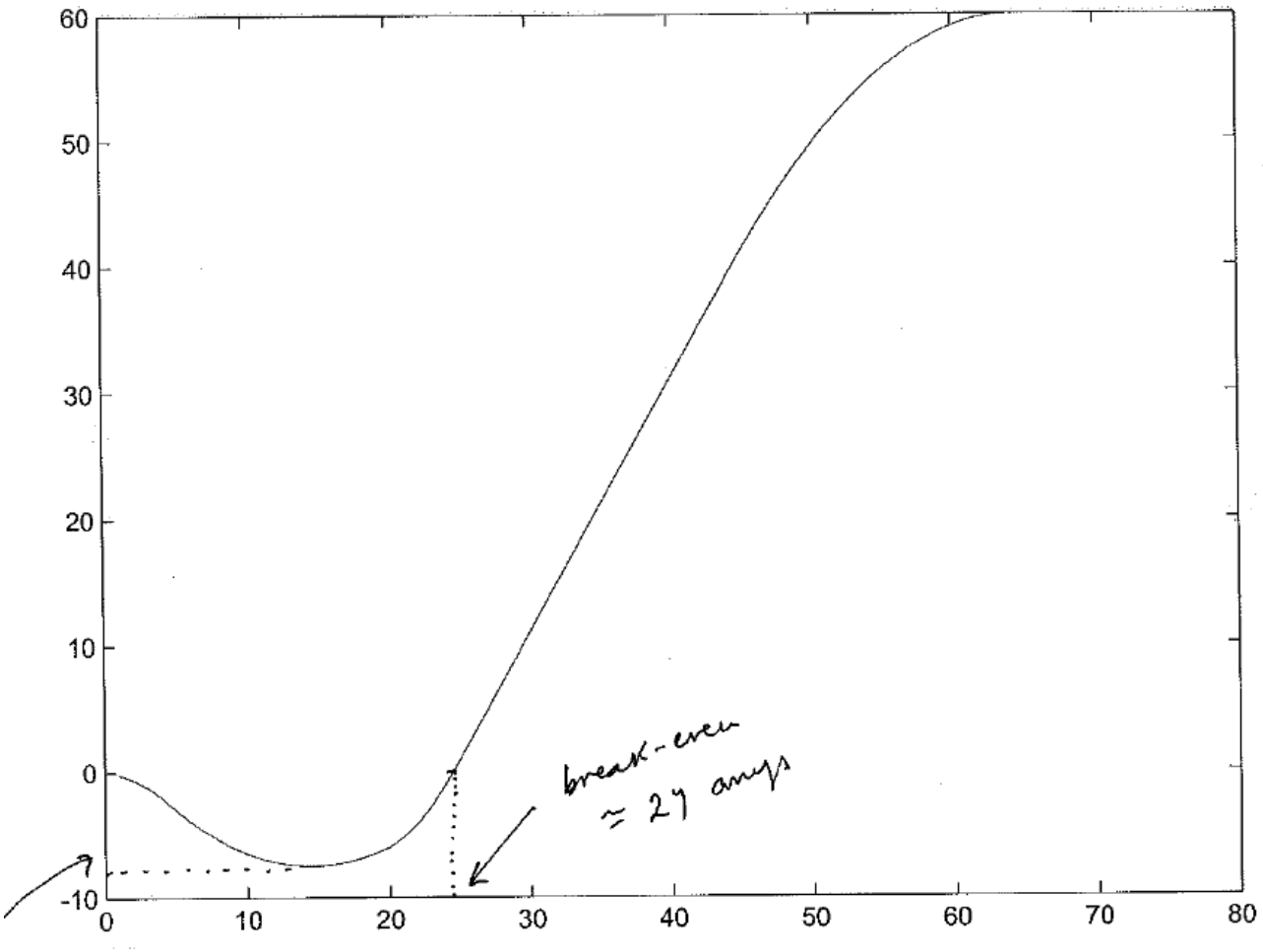


# Simple dynamic EROEI analysis



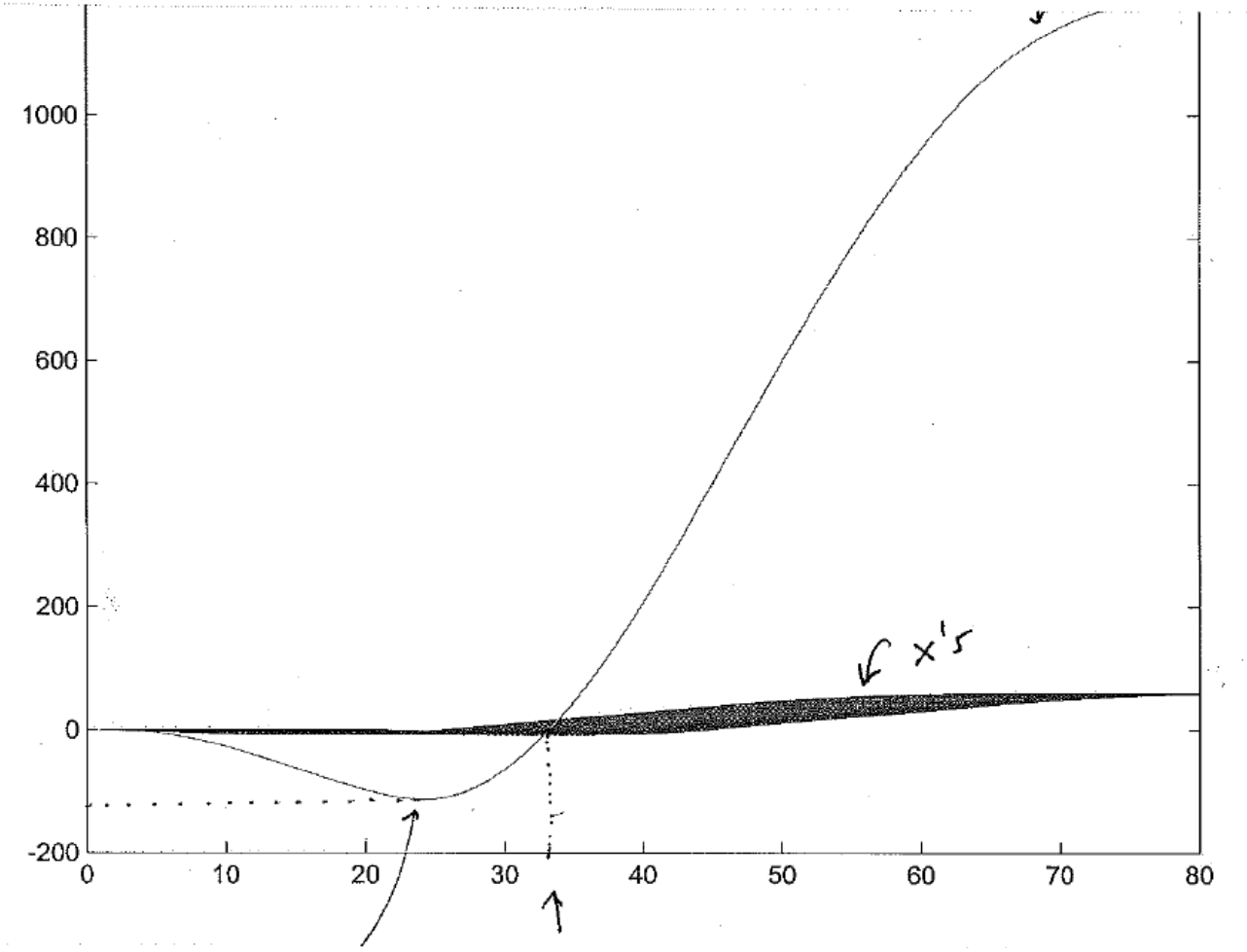

- Start one construction per year
- Shift net energy and add

# Simple dynamic EROEI analysis




- Build 20 nuclear reactors during next 20 years
- Break-even year 24

# Simple dynamic EROEI analysis




- Build 400 nuclear reactors
- 20 programs os 20 reactors, one per year
- Break-even year 32

# Thanks very much ...