The current financial crisis: Its impact for nuclear power's future

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The Nuclear Renaissance

- Many previous 'second comings' but this one more determined and greater backing from government than previous revivals
- USA and UK seen as the 'bell-wether' markets but orders still several years away
- Problems emerging with the Renaissance even before the financial crisis, especially on financing and cost escalation
- Will the financial crisis affect the 'Renaissance' or will it just be a convenient excuse when things go wrong for nuclear?

Will nuclear be attractive to banks?

- Financial crisis will make banks more risk-averse and more diligent in their risk assessment procedures, but they will be looking to lend money to 'good' projects
- If nuclear ordering is to be possible, banks will have to be protected from the risks inherent in nuclear projects
- This can be done by consumers bearing the risk through cost pass-through, tax-payers through government credit guarantees or vendors through turnkey contracts
- Are tax-payers, electricity consumers or vendors willing to take this risk?

Olkiluoto

- For Olkiluoto, consumers, taxpayers and vendors all took the risk
- The plant was covered for about 25% of its costs by export credit guarantees (France & Sweden)
- TVO is owned by its consumers, electric-intensive industry who contract to buy power at cost for the life of the plant
- The plant was supplied under whole plant turnkey terms

Experience at Olkiluoto

- Everything has gone wrong. Plant is 3 years late, about 60% over budget & the turnkey contract is subject to bitter dispute
- Electric intensive industry cannot afford to buy high-price power
- Is there a risk that TVO will default?
- Olkiluoto should be the clearest warning to consumers, vendors, and credit guarantee agencies of the economic risk of nuclear
- Olkiluoto has demonstrated again that turnkey contracts are a risk vendors cannot afford to take

Deregulation & investment risk

- Many large markets where nuclear has strong governmental backing (China, India and Russia) will remain cost-plus markets
- Most markets in Europe are oligopolies but few are so uncompetitive that cost pass-through can be assumed (EDF?)
- US deregulation has stalled but in states where there is cost-of-service regulation, can financiers assume that regulators will allow recovery of cost overruns?

US - Credit guarantees

- Without credit guarantees for 80% of cost at least for the first units, renewed ordering in the USA will probably not happen
- Will a few demonstration plants be enough to show financiers that nuclear has changed enough?
- If 3 units of 5 'innovative' designs are built in the USA, this will require guarantees of about $120bn
- 4 out of 5 designs are supplied by Japanese-owned companies and the fifth is French
- Can these companies rely on additional loan guarantee support from their governments to reduce the need for a US contribution?
- What will the Obama administration do?

Keynesian stimulation

- Maybe pressure to favour nuclear build as a way of reducing impact of recession
- Nuclear projects are promoted as job creators, eg Areva's US facilities
- But it is difficult to speed up nuclear programmes. Resource shortages – skills and production capacity – already mean existing timetables hard to keep
- Energy efficiency programmes would be much quicker to launch

Construction costs

Estimated construction costs increased 5-fold in only a decade and doubled since 2004, even before much construction has been completed. Five main factors

1. Rapidly rising commodity prices
2. Lack of component production facilities;
3. Shortages of the necessary nuclear skills
4. Weakness of the US dollar
5. Greater caution by utilities

Commodity prices

- These affect all plants but especially nuclear
- Commodity prices have peaked & are falling
- If high prices represented short-term supply-demand imbalance, will recession lead to loss of capacity and rapid price increases when recovery starts or will steel and concrete capacity grow quickly enough?
- If high prices are the result of resource constraints ('peak oil'), prices will go up again when demand increases

Production bottlenecks, skill shortages

- Already queues for key components, eg pressure vessels (Japan Steel Works is the only supplier of the forgings), pumps etc. 5 year backlog
- Areva building new plant in Virginia to make large components including pressure vessels - completed 2011 but still buying forgings from JSW
- S&P expects EDF and Tokyo Electric to provide skills until US capabilities are rebuilt, but will they be available?

Weakness of US dollar & utility caution

- Value of dollar fell sharply from 11/2005-7/2008 - €1=$1.17 to €1=$1.57 but by 2/2009 was back to €1=$1.30
- Nuclear price increase in Euro much less than in dollars. Will dollar prices now stabilise or fall?
- Will currency risk add to the nuclear risk premium?
- Utilities must know that public & regulators will not be so forgiving of poor utility management
- Experience at Olkiluoto salutary. A country with a good record with nuclear & the vendor with most experience in the past 30 years made a mess

Competitiveness & demand

- The financial crisis coming on top of very high energy prices is likely to have a large impact on energy demand. UK electricity demand is already down 3%
- Developing country demand is always hit much harder
- High prices stimulate energy efficiency and recession will reduce demand so predictions of 'lights going out' will be harder to justify
- High energy prices will make the public more receptive to energy efficiency measures

Conclusions – Plus factors for nuclear

- If economic risks of nuclear are reflected in finance, it is an expensive power source
- Finance was already difficult & if financial crisis makes the public complacent about loan guarantees, it might make it easier
- If public distrust with markets is reflected in energy, and deregulation is halted, this could favour nuclear
- Construction cost increases could be halted (and reversed?)
- Nuclear could be seen as a 'job creator'

Conclusions – Minus factors for nuclear

- Finance costs will increase and there will be pressure from financiers for loan, market and vendor guarantees
- Energy efficiency achieves more policy aims than nuclear: public welfare, energy security, GHG reductions, job creation with few risks
- Demand will fall short-term and increase slower in the medium term
- Falls in cost increases from lower commodity prices will be small & swamped by cost increases as paper designs are built.
- Lower commodity prices mean lower fuel prices