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MEM180

Les enjeux de la filière uranifère au Québec

6211-08-012

World Market Situation of Uranium (U): a critical review

**Prof. A. Nidecker, MD / IPPNW Switzerland
for the hearings of the BAPE Commission
Quebec / Canada**

Basel, Oct 15th 2014



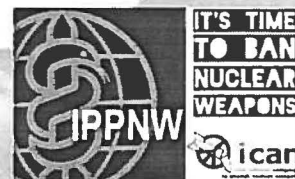
Topics


- ✿ Production countries / - volumes / terms
- ✿ The market situation / prize development (IAEA)
- ✿ Assessment by other players in U market
- ✿ World nuclear industry status report
- ✿ Conclusions

U Producers/Production Volumes estimated in 2007 (!!)

Country	Prod.Cap.(tU) by	
Australia	10 000	2015 more by 2018?
Canada	10 000	stable ?
Kazakhstan	15 000	2010 18000 by 2012 ?
Niger	10 000	2012
Russia	13 000	2015 reduced recently
USA	12 000	2015 ?
Namibia	4 000	2009 6000 by 2012 ?
Uzbekistan	2 500	5000 by 2012 ?
Others	3 500 ?	
Total	> 80 000	2015

Source: IAEA **Proj. global demand > 85 000 (tU)**





Uranium (U_3O_8) and Enrichment – a relationship (TL Neff, MIT, 2006)

A resource and a process.....substitute factors in the production of nuclear fuel

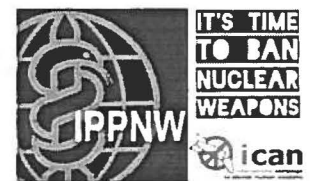
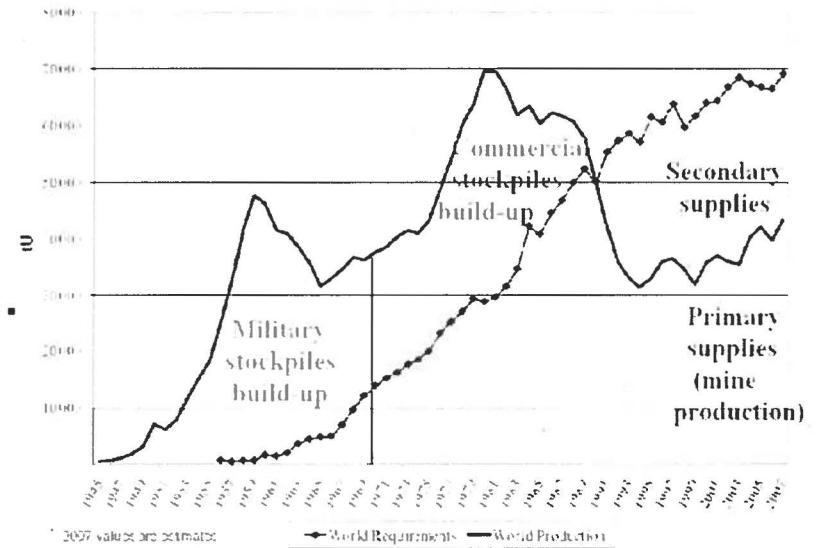
- ✦ Enrichment measured in SWU = separative work unit .SWU = not energy, but expression of efficiency of separation process
- ✦ Nuclear fuel is function of U supply, enriched output and depleted tailings
- ✦ In most production processes, change in price of one factor leads to change in price of its substitute: **If both U and SWU scarce: price of both will rise..** .(Neff, 2006)



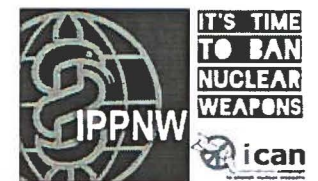
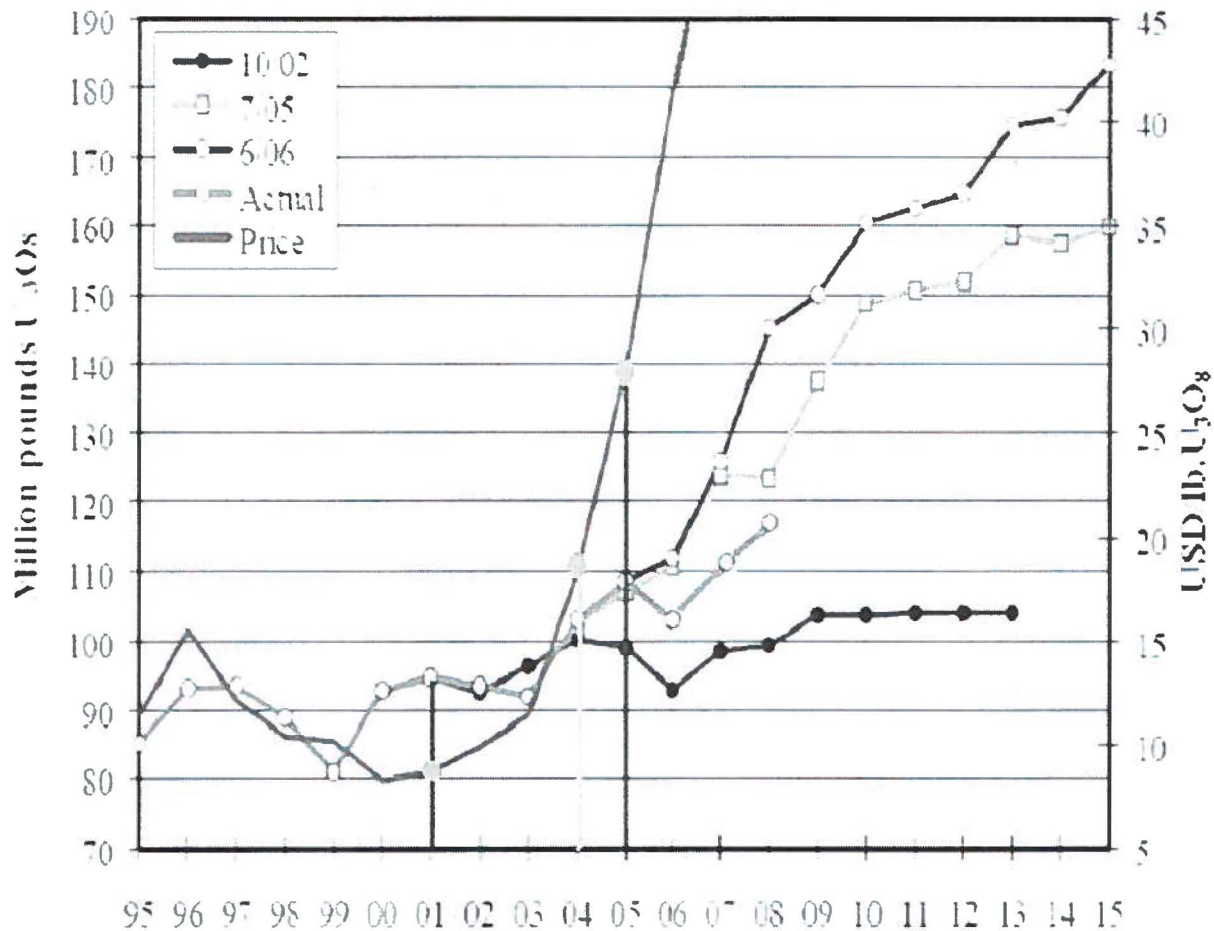
U Market today and challenges for the future

J. Slezak U resource specialist IAEA 10/09

- ✳ U market often been described as „unstable, not transparent, volatile, unpredictable“ ...
- ✳ U production initially for purely military purposes
- ✳ Since mid 60's also influenced by Nuclear industry
- ✳ Since 90's up to „Fukushima“ world production of U behind global demand = explains interest of many countries to start U mining. However since then shrinking global demand



Changes in Projection of U Production ...



U Participation Corporation (UPC): recommendations (2008) ...

- * Enough resources available, but this does not necessarily mean enough production
- * Production climbing slowly but still lagging behind demand. Increase needed to meet (proj.) demand
- * Unknown volume of secondary sources
- * Strong and stable market conditions necessary to encourage necessary investment
- * **Concl: due to low public acceptance and volatile market still unpredictable situation, but „hope“ for future higher U market stability, otherwise ...
??**





World Nuclear Association – realistic predictions? U market prize levels

Uranium Oxide Price

35.65 USD/lb

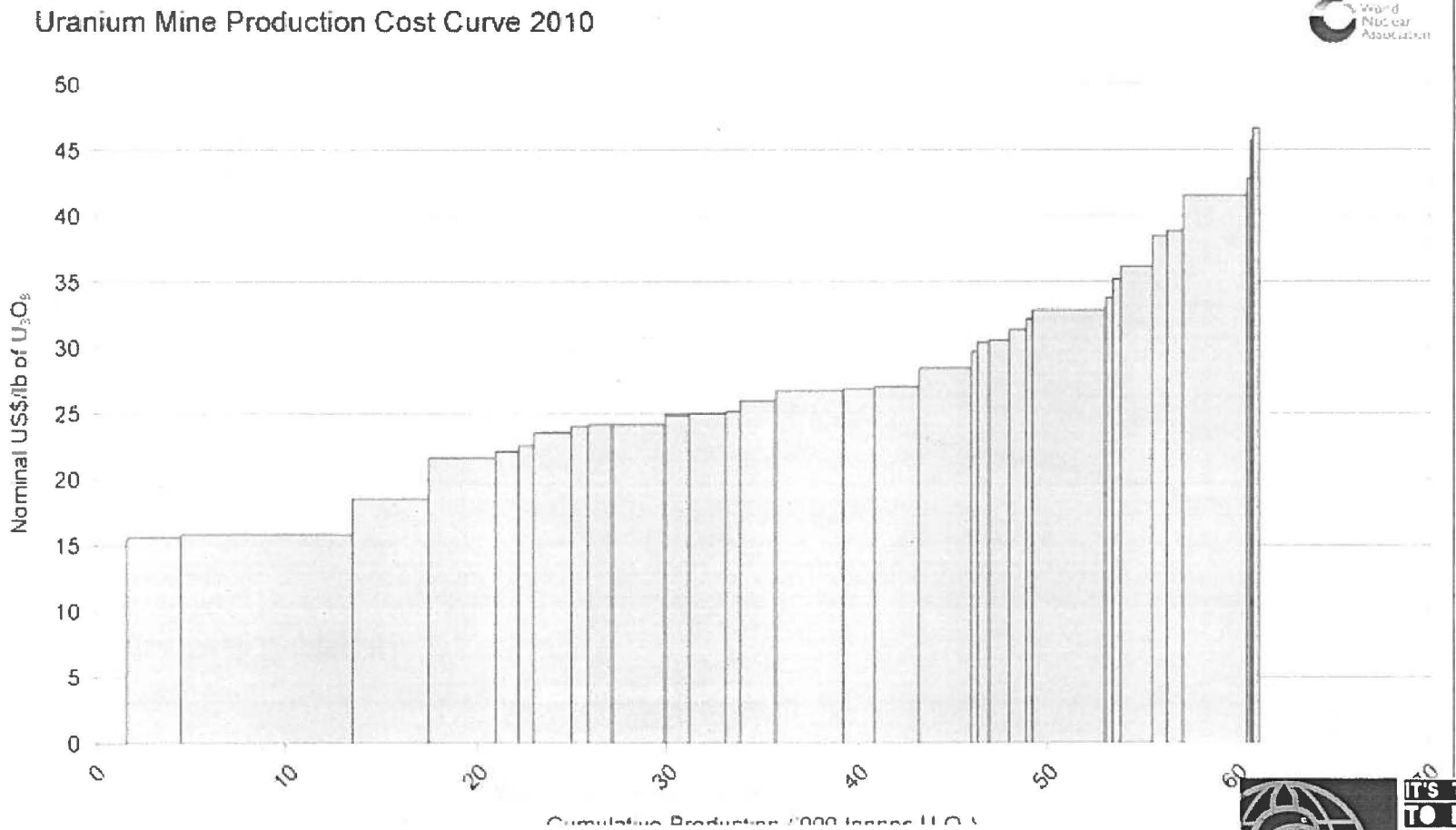
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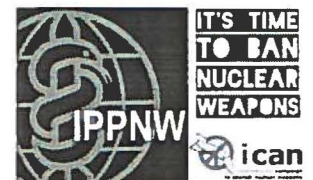
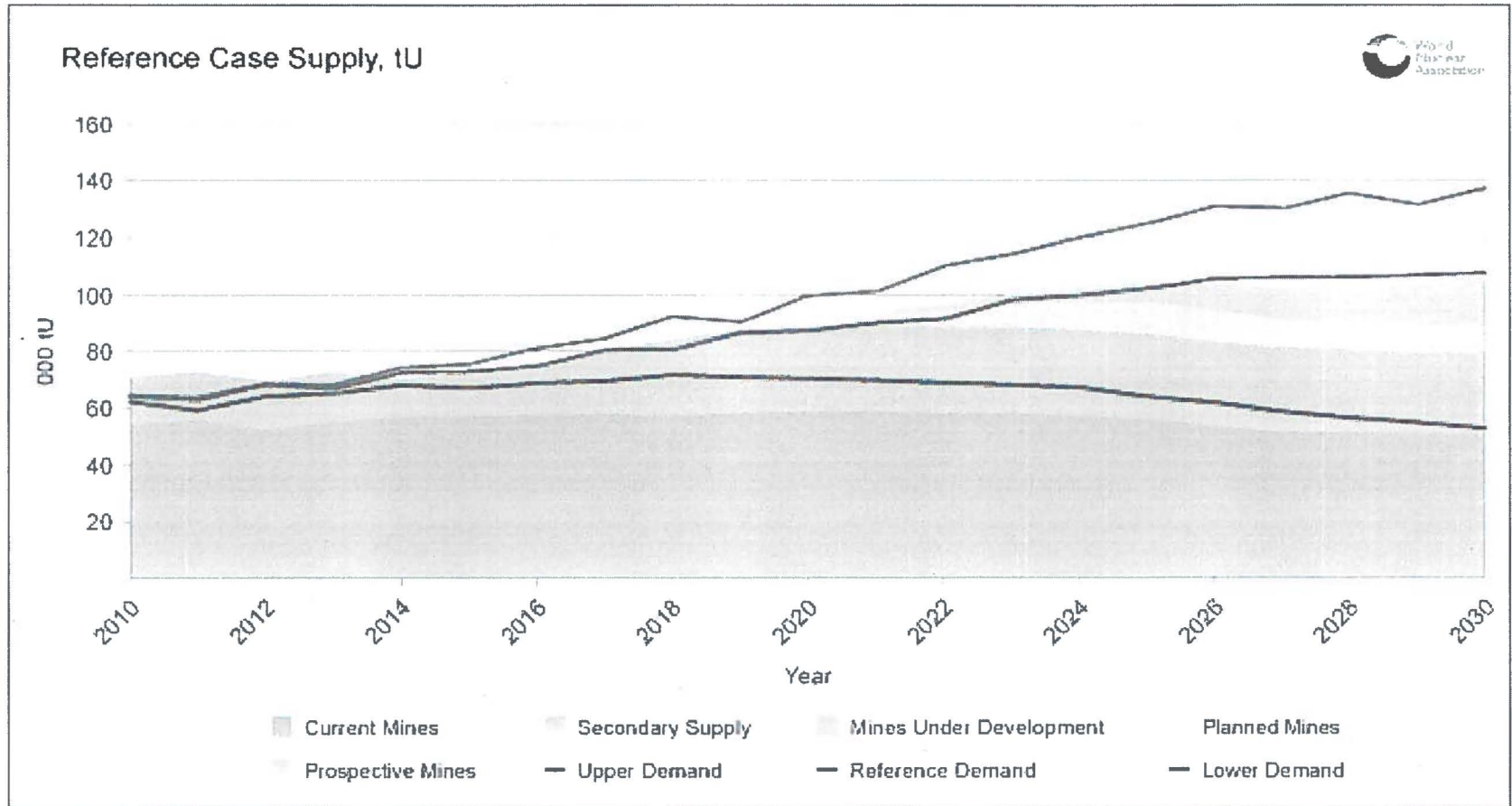
InfoMine.com

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World Nuclear Association - Update on U market 2013: Product costs



Production & Demand: Scenarios?



World Nuclear Association: explanations...

- Mineral commodity markets = cyclical. Quoted “spot prices” usually represent less than 20% of supply. Most trade is via long term contracts with producers selling directly to utilities.
- The reasons for fluctuation in mineral prices relate to demand and perceptions of scarcity. The price cannot indefinitely stay below the cost of production, nor will it remain at very high levels for longer than it takes for new producers to enter the market and anxiety about supply to subside
- **Conclusion of last sentence? logically new producers will need to compete with established ones and surely will meet low price levels..**





One Ex.: Roessing mine Namibia: 2nd U exporter in Africa nearly closed...

<http://allafrica.com/stories/201305300555.html> by C
KAIRA, 30.5.13

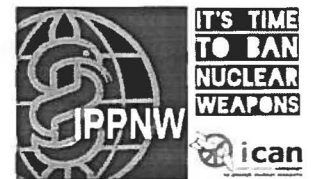
THE management of Rio Tinto's Rössing mine was considering placing the uranium mine on care and maintenance like Areva's Trekkopje as a way of arresting the perilous financial situation the company is facing.

“The situation is bad,” a source said and that „Rio Tinto, the Australia-based majority owner of the mine, has also been considering selling the mine“.



Last question: what are the U3O8 customers doing ?

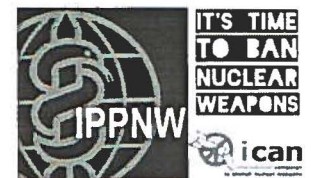
- * Nuclear weapons producers: dismantle old nukes (although not as quickly as we like...) and use HEU from weapons to produce low enriched reactor fuel, supply approx 15 % of demand only
- * Nuclear power plant operators: although in China, Russia and S-Korea new plants are going up, global park of NPP will shrink...
- * What does the nuclear industry status report 2013 say ??



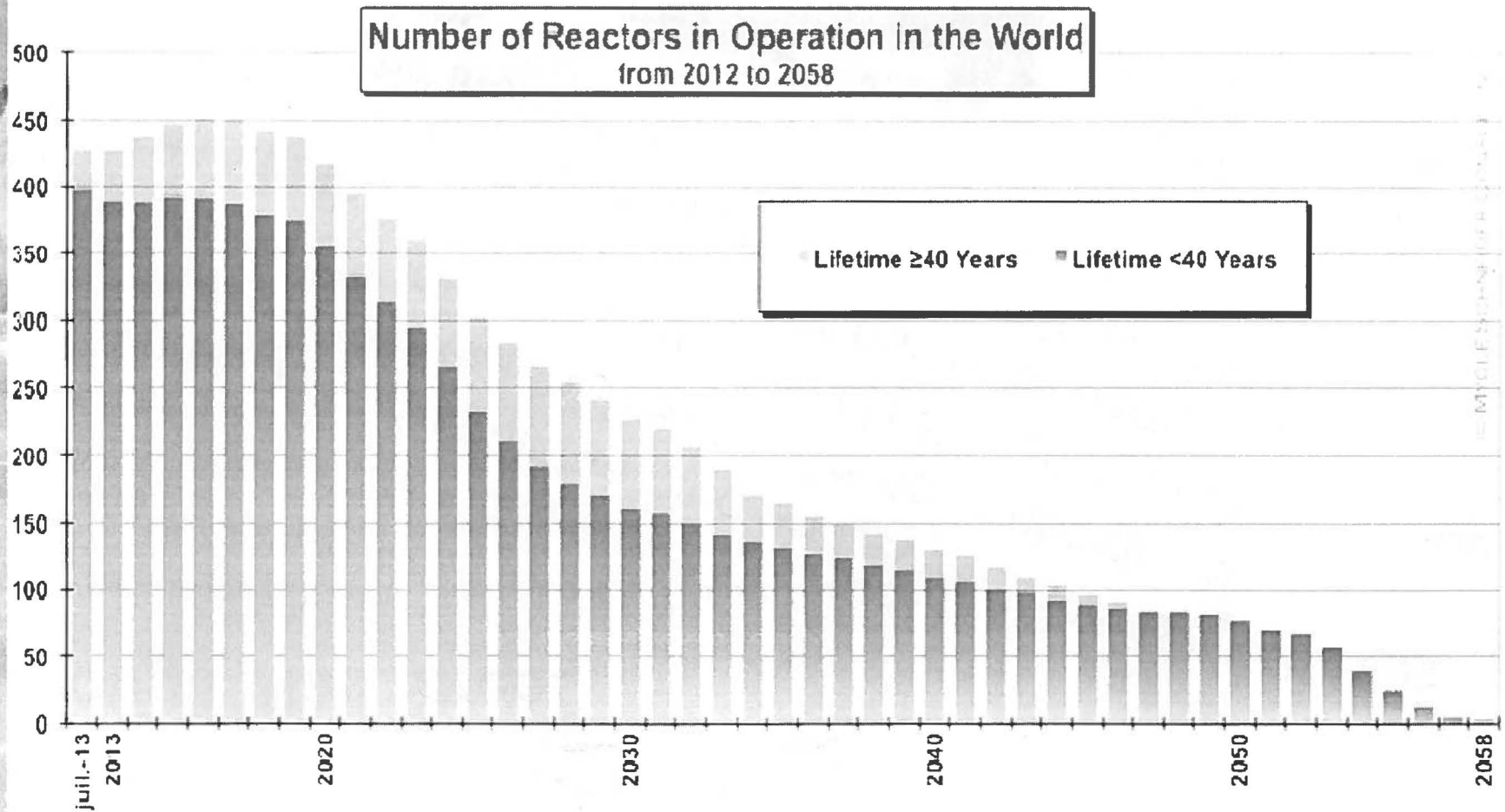
World Nuclear Industry Status Report 2013 (WISE pblsd 7/2013)... (I)

Key results:

- * 10% of global electric energy demand are met NP (down from 17% 1993). Share of global commercial energy prod 4.5%
- * 66 reactors under construction in 14 countries (average construction time is 8 years) but
- * 9 reactors listed „under construction for > 20 yrs
- * 45 projects without official start-up date on IAEA database
- * 23 reactors have multiyear construction delays. The other 43 reactors have not yet reached projected start-up dates. 44 of the units in China, India and Russia



World Nuclear Industry Status Report in 2013... (II)



Nuclear sending shock waves through Wall Street

By Barbara Vergetis Lundin , Fierce Energy, August 7, 2012

"The Duke decision to pull the plug on Levy follows by just one day the announcement that the French-subsidized nuclear giant EDF is pulling out of the U.S. nuclear power market due to the inability of nuclear power to compete with alternatives and the dramatic reduction in demand growth caused by increasing efficiency of electricity consuming devices,"

Duke Energy has announced that it will retire its Levy nuclear reactor project in Florida. This is the second such announcement in just a few weeks.....

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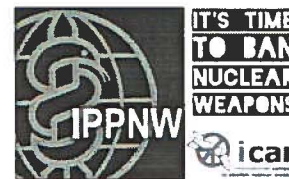
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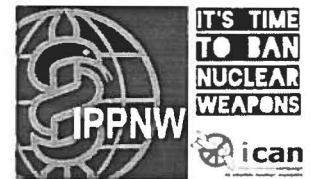
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World Nuclear Industry Status Report 2013...(IV) The alternatives

- * In contrast, renewable energy shows rapid growth figures. China, Germany, Japan generate more power from renewables than from nuclear
- * Global investment in renewable energy totaled US\$268 billion in 2012, 5 x 2004 amount. In same period, total cumulative investment in renewables is over US\$1 trillion. Compares to nuclear power investment of about \$120 billion
- * Global nuclear capacity decreased again in 2011, while the annual installed wind power capacity produced 500TWh and Solar 100 Twh more than in 2000 alone. While nuclear produced 100 TWh less in same time period. In China Solar electricity generation grew by 400%



World Nuclear Industry Status Report ...(V)

Quotes by 2 co-authors:

- * „Portrait of an industry suffering from the cumulative impacts of the world economic crisis, effects of Fukushima, ferocious competition and its own planning and management difficulties“ (M. Schneider)
- * „The market for nuclear is shrinking year by year, while renewable energy deployment continues at pace and in an ever increasing number of countries. With nuclear power becoming more expensive than a widening range of renewable energy technologies, this trend will only continue“ (A. Froggatt)





Nuclear Renaissance anywhere ... ??

Invest in Nuclear Power plants ...??

Invest in new Uranium Mines??

