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Toshiba gives up on Moorside nuclear power project in the UK

Author: Jim Green – Nuclear Monitor editor

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On November 8, Japanese conglomerate Toshiba announced its withdrawal from the planned Moorside nuclear power project near Sellafield in Cumbria, UK.¹ Having failed to find a buyer for associated subsidiaries – NuGeneration Ltd and Advance Energy UK Ltd – Toshiba will take steps to wind them down in the coming months. The site will be handed back to the UK Nuclear Decommissioning Authority.

NuGen envisaged the construction of three AP1000 reactors at Moorside, or 2–3 South Korean AP1400 reactors if South Korea's KEPCO had purchased NuGen.² NuGen was established in 2009 by GDF Suez of France, Scottish and Southern Energy, and Spain's Iberdrola. Scottish and Southern Energy withdrew in 2011, Iberdrola sold its stake to Toshiba in 2014, and GDF Suez (by then re-named Engie) sold its stake to Toshiba last year. Engie enforced its contractual right to offload its shares in NuGen to Toshiba following the bankruptcy filing by Toshiba's US nuclear subsidiary Westinghouse in March 2017. Thus, Toshiba has been the sole owner of NuGen since mid-2017.³

The decision to liquidate NuGen was based on Toshiba's "policy to eliminate risks to the overseas nuclear power construction business," the company said in a statement.¹ Toshiba almost went bankrupt following Westinghouse's bankruptcy filing (Westinghouse was subsequently sold to Canada-based Brookfield Asset Management). Toshiba has reportedly spent around US\$524 million on the Moorside project and will incur costs of around ¥15 billion (US\$132 million) to liquidate NuGen.⁴

Potential buyers

Toshiba's November 8 statement said: "[N]otwithstanding negotiations with multiple companies, Toshiba is unable to anticipate to complete the sale of NuGen during FY2018, to March 31, 2019. After considering the additional costs entailed in continuing to operate NuGen, Toshiba recognizes that the economically rational decision is to withdraw from the UK nuclear power plant construction project, and has resolved to take steps to wind-up NuGen."¹

The announcement followed 18 months of negotiations with potential buyers of NuGen. South Korea's KEPCO won 'preferred bidder' status in December 2017, reportedly despite serious competition from China General Nuclear Power Corporation.⁵

KEPCO planned to put together a consortium, purchase NuGen, pursue UK licensing of its APR1400 reactor design (which would take about four years), and then build reactors at Moorside and perhaps elsewhere.

But KEPCO lost its preferred bidder status in July. Toshiba reportedly explored options with China General Nuclear Power Group. Nothing eventuated, 60% of NuGen's 100 staff were made redundant in September, and NuGen will likely be liquidated early in the new year and no longer be a burden on Toshiba's books.

Subsidies

NuGen CEO Tom Samson said that Toshiba's efforts to sell NuGen were complicated by the emergence of a new policy framework based on a 'Regulated Asset Base' (RAB) model.⁶ The RAB model is another mechanism to provide large subsidies to nuclear reactor construction companies, by protecting them from the risk of cost blowouts and passing that risk onto taxpayers and electricity ratepayers.^{7,8}

Samson said: "Unfortunately, given that the RAB model is still in early stages of development, has not been determined as policy yet and still faces a lengthy legislative process before it can be applied to new nuclear, it has not proven possible to find a buyer willing to take that level of policy and legislative risk when entering the UK; hence we have been unable to bring an acquisition to a conclusion."⁶

The RAB proposal only surfaced in June 2018 and it is far from settled. The *Guardian* reported in September that a team of about 30 government officials are working on new nuclear financing, and the government's feasibility study on using RAB for new nuclear is expected in January.⁹ A RAB model for nuclear power might not survive a change in government: Labour called the mix of RAB and nuclear power a "spectacularly risky deal for consumers" and shadow energy minister Alan Whitehead said it was "reckless".⁹

South Korea

A 'senior government figure' told the *Financial Times* that he is "not optimistic" that the Moorside project can be salvaged.¹⁰ But there might yet be an agreement for KEPCO to build reactors at Moorside, whether or not NuGen is liquidated and the site handed back to the government's Nuclear Decommissioning Authority. South Korea's Ministry of Trade, Industry and Energy said in a statement following Toshiba's November 8 announcement: "The ministry plans to closely coordinate with the British government on the Moorside project while monitoring the NuGen liquidation process with KEPCO."¹¹ One discussion point between Toshiba / NuGen, KEPCO and the UK government is a joint feasibility study that is considering profitability and risk when applying the RAB model to Moorside.

KEPCO is majority owned by the South Korean government, and one of the unknowns is the government's commitment to the Moorside project and how many billions it is prepared to gamble on a successful outcome. South Korea is slowly phasing out nuclear power but the government's official position is that it supports the ongoing efforts of KEPCO (and KH&NP) to secure nuclear contracts overseas.

An editorial in *Korea Times* linked the domestic nuclear power phase-out with discussions on Moorside: "The scheduled contract calls for the main contractor to run the Moorside nuclear power plant for more than three decades. The British side might have found it difficult to believe KEPCO's promise that it could maintain and repair the power station for such an extended period, while Korea would have phased out its own nuclear power stations. It is not just a matter of business but ethics if a country avoids operating nuclear plants for reasons of safety while trying to sell them to other countries."¹²

Direct government investment

In all likelihood, massive government subsidies would be available to any company prepared to pursue the Moorside reactor project – not as massive as those provided to the French and Chinese developers of Hinkley Point C (primarily in the form of a guaranteed 'strike price' for electricity produced, and loan guarantees), but massive nonetheless. That makes the lack of interest in NuGen all the more significant.

Tim Yeo, a former Conservative minister and now a nuclear industry lobbyist, described Toshiba's November 8 announcement as a "huge disappointment and a crushing blow".¹³ Yeo accused the government of "dithering" and failing to offer a firm financial assistance package.

In June 2018, NuGen welcomed a government pledge to invest directly in Hitachi's proposed nuclear power project at Wylfa, Wales¹⁴ and no doubt NuGen (and its new owner, if one can be found) would gratefully accept such largesse.

Rob Johnston, chief executive of Cumbria Chamber of Commerce, speculated that when KEPCO "realised that the UK government wasn't going to invest as a partner, their enthusiasm for Moorside waned overnight."¹⁵

For the time being, the UK government seems willing to directly invest in the Wylfa project but not Moorside. The government is nonetheless under pressure to directly invest in Moorside, with Justin Bowden from the energy union GMB counterposing that "common sense" option to the "sheer folly" of relying on foreign companies and countries to build critical infrastructure. Bowden didn't seem confident about the future of the project, however, saying the "government has blood on its hands as the final sad but predictable nail is banged into the coffin of Toshiba's jinxed jaunt into nuclear power".¹⁶ In addition to lobbying for a revival of the plan to build large reactors at Moorside, GMB is also lobbying the national government to consider supporting the construction of one or more small modular reactors at Moorside.¹⁷

Following Toshiba's announcement, Cumbria County Council called on the UK government to take "any necessary steps" to get the Moorside project moving ahead and noted that projects like Moorside are highly unlikely to proceed without Government support, whether that be equity acquisition (direct investment), underwriting potential losses or guaranteeing the strike price.¹⁷

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UK nuclear renaissance splutters while renewables boom

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UK nuclear generation is down by more than a quarter since a 1998 peak; since then, four gigawatts of nuclear capacity has shut down. Most of the 15 operational reactors are ageing and all of them are expected to close by 2035, with only Sizewell B lasting beyond 2030. It seems increasingly unlikely that new build will match retirements.

In early 2018, the Department for Business, Energy and Industrial Strategy (BEIS) downwardly revised its nuclear power projection, from 17 GW to 14 GW in 2035, compared to current capacity of 8.9 GW. Renewable capacity is projected to reach 68 GW by 2035.¹ Other BEIS projections have fallen further; for example in 2014 BEIS anticipated 67 terawatt-hours (TWh) of nuclear generation by 2024, almost double the more recent estimate of 34 TWh in 2024.²

The UK Nuclear Free Local Authorities (NFLA) said in the aftermath of Toshiba's November 8 announcement that it plans to liquidate the NuGen subsidiary that was planning reactors at Moorside:³

"While the nuclear industry has lamented the energy and jobs potential it has consistently advocated would come from such developments, it is becoming increasingly clear that the large costs of new nuclear, their sheer complexity and the large subsidies in dealing with the current waste legacy makes such large investments required for them increasingly difficult to achieve. In contrast, increasing evidence shows the costs of renewable energy, energy efficiency, energy storage and suchlike is coming down year on year. Such projects are also much quicker to realise and do not have the safety and radioactive waste issues to resolve that makes new nuclear so complicated and expensive."

The NFLA endorsed an editorial in the *Financial Times*. An indicator of changing views towards nuclear power, the *Financial Times* said:⁴

"The cost of replacing old nuclear plants with new ones has steadily risen while technological advances have made the opposite true of wind and solar power. There could still be a case for nuclear power in a complementary mix of supplies that ensure both energy stability and emissions reductions. But that case may weaken to the point of obsolescence by the time five remaining nuclear projects – at various stages of planning – are due to be built.

"The state is not in a position to invest across the board. The borrowing required would run into tens of billions of pounds. Rather than approaching this quandary piecemeal, the government should commission a fresh strategic review. The last one took place in 2013 when the energy landscape looked very different. To keep its place in national ambitions, nuclear power needs to come in at a lower cost and to attract investment. It should not require subsidies unavailable to rivals."

A Business Leader (editorial) in *The Guardian* said:⁵

"Toshiba's decision to pull out of building a nuclear power station in Cumbria last week will cause shockwaves far beyond the north-west of England. ... Ditching new nuclear would require a huge increase in the amount of wind and solar power already expected in coming years. It would need dramatic progress on energy storage, smarter grids and even more efficient use of energy. All those things will be difficult. But pursuing an impossible atomic dream, as Moorside demonstrates, looks even harder."

National Infrastructure Commission

In a 163-page infrastructure assessment released in July, the government's National Infrastructure Commission argued that the government should take a slower, step-by-step approach to nuclear build and that the government should not agree to support more than one nuclear power station beyond Hinkley Point C before 2025.⁶ Sir John Armitt, chair of the Commission, said there is no need to rush with nuclear because "during the next 10 years we should get a lot more certainty about just how far we can rely on renewables."⁷

Armitt said:

"One thing we've all learnt is these big nuclear programmes can be pretty challenging, quite risky – they will be to some degree on the government's balance sheet. I don't think anybody's pretending you can take forward a new nuclear power station without some form of government underwriting or support. Whereas the amount required to subsidise renewables is continually coming down. We've seen how long it took to negotiate Hinkley – does the government really want to have to keep going through those sort of negotiations?"⁸

Richard Lowe from AECOM Infrastructure & Environment UK said in response to the National Infrastructure Commission report: "This sort of message would have a lot of shockwaves. You would have to presume that [the planned] schemes would be affected. It's going to cause Korean and Chinese investors to have a long hard look at whether they still make that investment".⁹ Likewise, Tim Yeo said: "If this is taken on by government, it's a serious blow. You're not going to get people to invest in their supply chains on the basis of only one nuclear plant coming forward."⁹

The Commission estimated that an electricity system powered mainly by renewables would cost no more than relying on new nuclear power plants; indeed it estimates slightly lower average costs for a scenario with 90% renewable and less than 10% nuclear compared to a scenario with 40% renewables and around 40% nuclear. The Commission said the economic analysis factored in the cost of balancing intermittent renewables through storage, smart grids and interconnectors.

The Commission's report states that renewables have been undergoing a "quiet revolution" and there "is ample scope to build on this success in years to come." It says that by 2030 a minimum of 50% of power should come from renewables, up from about 30% today. The *Guardian* reported in July that renewables have already overtaken nuclear for electricity generation; wind, solar and biomass power stations out-produced nuclear in the previous three quarters with renewables supplying 28.1% of power in the April–June quarter compared to nuclear's 22.5%.⁸

Armitt said: "When it comes to energy, then we see a future of renewables. ... I think where I have been accused of a change of mind is on nuclear. Where, in the past, I've been a strong supporter of nuclear, this work that we have done in the national infrastructure assessment – and the evidence base that we have got for it – I think that we are in a different world today. We don't have to be as dependent on a nuclear solution as maybe we thought we needed to be 10 years ago."¹⁰

More bluntly, the *Guardian's* financial editor Nils Pratley said: "The government, when it gets back to governing, needs to respond. Its mania for new nuclear plants has looked out-of-date, wrong-headed and unnecessarily expensive for ages. Now even its own infrastructure adviser agrees. A U-turn is required."⁷

Committee on Climate Change

The Committee on Climate Change (CCC) – an independent, statutory body established under the Climate Change Act 2008 – notes in a June 2018 report that apart from Hinkley, "limited progress" has been made with new nuclear projects whereas renewable power generation has increased four-fold.¹¹

The CCC report states that the share of electricity generated from low-carbon sources has increased from 20% in 2008 to 52% in 2017, driven by a quadrupling of renewable generation between 2008 and 2017, from 21 TWh to 91 TWh. Generation from nuclear power remained fairly constant over that period at around 60–65 TWh per year. Total electricity consumption has decreased by around 13% since 2008, the report states, despite a 5% increase in the total number of UK households.

In a section on the "limited progress in new nuclear", the CCC report states:

"The aim is for the Hinkley Point C plant to commission in 2025, but limited progress has been made with other new nuclear projects, aside from the recent announcements around the Wylfa nuclear plant. Site development and regulatory approval milestones have been passed, though formal negotiations have only just begun with one developer, raising questions over the likelihood of several new nuclear plants commissioning before 2030, beyond the Hinkley Point C project.

"One additional nuclear power plant beyond the Hinkley Point C project by 2030 is considered in two scenarios. If new nuclear projects were not to come forward, it is likely that renewables would be able to be deployed on shorter timescales and at lower cost

"The Government must put in place a progress monitoring framework that allows for risks to delivery of low-carbon projects to be identified ahead of time. In addition, contingency plans for the delay or under-delivery of projects, such as new nuclear or imported electricity, must also be developed. These plans should allow for alternative low-carbon generation to be contracted in time to replace any under-delivery without increasing carbon emissions."

Nuclear doom and gloom

Another indication of the gloom settling over the UK nuclear industry came from Alistair Smith, formerly nuclear development director at contractor Costain. He said in mid-2018 that most contractors have already lost faith. "Aside from those involved in Hinkley, contractors have lost interest and have moved on to more exciting things. Everyone's been burnt so many times that it would take a lot to convince a chief executive to go for another project again."¹²

EDF Energy – majority owner of the UK's nuclear power stations – is considering selling part of its 80% stake in operating UK nuclear power plants while retaining majority ownership. Centrica plans to sell its 20% stake by 2020.¹³ And therein lies one of the problems with the UK nuclear power industry: more insiders want out than outsiders want in.

Meanwhile, the Hinkley construction project moves ahead, £2.2bn over budget and a year behind schedule.¹⁴ In November 2017, the UK Parliament's Public Accounts Committee said Hinkley Point amounts to a "bad hand" and "the poorest consumers will be hit hardest"¹⁵ while the UK National Audit Office said Hinkley Point is "a risky

and expensive project with uncertain strategic and economic benefits."¹⁶

Emeritus Professor Steve Thomas told a Parliamentary forum in September 2017: "A recent study estimated that Hinkley would be the most expensive 'object' built on earth. Yet it would use the EPR, a technology unproven in operation and which has run into appalling problems of cost and time overruns in the 3 projects using it. EPR would be supplied by Areva NP, which is in financial collapse and might not be saveable and has been found to be falsifying quality control records for safety critical items of equipment for up to 50 years."¹⁷

Current nuclear new build proposals:

	CAPACITY	REACTOR TYPE	INVESTORS
Hinkley Point C	2 x 1,600MW	EPR	EDF 67%, CGN 33%
Moorside	Approx. 3,000 MW	?	Uncertain
Wylfa Newydd	2 x 1,350 MW	ABWR	Horizon Nuclear (Hitachi-GE)
Sizewell C	2 x 1,600 MW	EPR	EDF 80%, CGN 20%
Oldbury	2 x 1,350 MW	ABWR	Horizon Nuclear (Hitachi-GE)
Bradwell	2 (?) x 1,150 MW	Hualong One	CGN 66.5%, EDF 33.5%

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An epitaph for Sellafield's THORP reprocessing plant – 'Never did what it said on the tin'

Author: Cumbrians Opposed to a Radioactive Environment (CORE)

869.4760

A Sellafield Stakeholder committee was recently told that, by the 11th November, THORP would have chopped up (sheared) its last batch of spent fuel, bringing to an end almost a quarter century of operation – a performance described to stakeholders as 'mission completed successfully'.

As has now become customary for such milestone events, THORP's performance is already being eulogised in a way that can be reconciled neither with the plant's 'mission' as clearly defined by its owner and developer British Nuclear Fuels plc (BNFL) nor indeed with the well documented facts on the ground today.

For right up to its opening in 1994, plans for THORP's operations – its mission – were laid out by BNFL through a range of specific and clearly defined performance targets that included not only how much spent fuel would be reprocessed (and at what rate) over specified timescales and how much profit would be made during the first 10 years of operation (the Baseload).

In more general terms BNFL also aired its aspirations of winning new business for THORP and its ability to operate as a 'recycling' plant. Against these projections, it is only right that the success or failure of THORP's mission is judged on whether, in the event, the plant has done 'what it said on the tin' in terms of meeting those BNFL targets and hopes.

Based on the officially published 'annual throughput' figures (tonnes reprocessed per year) collated by CORE since the plant opened in 1994, THORP has failed to meet those operational targets and schedules by a country mile. Aided and abetted by the periodic failings of associated 'support' facilities such as the High Level Waste Evaporators, THORP's major operational, recycling and potential financial shortcomings, as highlighted below, represent the polar opposite of a 'mission completed successfully'.

'THORP will reprocess 7000 tonnes of fuel in the first 10 years of operation at a rate of 1000 tonnes per year'

Just 5045 tonnes were reprocessed in the first 10 years of operation – the 7000 tonnes only being completed on 4th December 2012 – over nine years late. Not once during the Baseload period (1994-2003) was the throughput rate of 1000 tonnes per year achieved.

'THORP will reprocess 800 tonnes per year during the Post-Baseload period (2004 onwards)'

Whilst the Baseload performance (above) strongly suggested that achieving this rate was highly improbable if not impossible, any chance was finally dashed by THORP's 2005 accident whose irreparable damage

slashed the plant's future throughput rate by some 50%. Since its restart in 2007 THORP has averaged 306 tonnes per year. [In 2005, a large leak of a highly radioactive solution was detected – the leak began in July 2004 and went undetected for nine months. British Nuclear Group was convicted for breaches of health and safety regulations and fined £500,000, and the incident was rated Level 3 on the INES scale.]

'Additional business for THORP is expected to be secured from overseas customers'.

No such business was ever secured. Conversely, over 850 tonnes of business was lost when, under a revised Atomic Law, German utilities chose – for economic and environmental reasons – to store their fuel in Germany rather than send it to THORP for reprocessing.

On its opening in 1994, THORP had secured 10,229 tonnes of reprocessing business from the UK, Japan and six European countries. On its closure in 2018 the plant will have reprocessed a total of just 9,300 tonnes 'with all contracts completed'.

'Thorpe: a world leading facility for the recycling of used nuclear fuel'

THORP was not designed to recycle spent fuel but to recover materials for subsequent re-use. Of these, the most contentious is plutonium – with a majority of the estimated 56 tonnes recovered by THORP now languishing unused in the Sellafield stockpile, including plutonium 'flag-swapped' to UK ownership by overseas customers who have no use for it.

White elephant

CORE's spokesman Martin Forwood said: "This technically complex 'first of a kind' facility, facing economic and contract doubts from day one, was always going to struggle to meet BNFL targets. It is not surprising that, with its failures, a plant officially dubbed as 'the jewel in Sellafield's crown' should have morphed so quickly into the white elephant expected by many. To assess it as a success would be deceitful in the extreme and represent 'Trumpery' at its most disingenuous."

That THORP was indeed to lose some overseas contracts will have come as no surprise to BNFL whose Director Alan Johnson warned in 1989 (five years before the plant opened) that the global change in attitude to reprocessing posed a very real threat to THORP and that "many of our major customers would love to cancel their contracts" (Channel 4 TV Documentary, 'Inside Sellafield').

Those customers, some of whom had already cancelled contracts in 1995 (and were to cancel more later), vented their frustrations on THORP at a meeting with BNFL in 2000 when they stated that 'your customers are losing confidence in BNFL's technical ability. This loss of confidence was enhanced by BNFL's apparent inability to reprocess our fuel within the agreed baseload period'. (Minutes of meeting held at Heathrow on 18th September 2000.).

The loss of major overseas business (at least 850 tonnes worth) will have impacted on THORP's financial viability. BNFL's claim of a £500 million profit being earned over the first 10-year Baseload period was based on a forecast income of £6 billion and (with decommissioning costs accounted for) operational costs of £5.5 billion. The latter have inevitably escalated as a result of the numerous accidents, equipment failures, unplanned events and unscheduled outages suffered by THORP during those first 10 years.

Under certain contracts, many such costs could not be foisted upon customers. In addition, the plant's decommissioning cost – put by BNFL in 1990 at an 'undiscounted' £700 million – has ballooned today to an 'undiscounted' £3.7 billion (NDA FoI response to CORE, 29 Oct 2018), thus raising further major doubts about THORP's profitability.

Such financial doubts are not new and were raised in the early days of THORP's operation by ex-BNFL Director Harold Bolter who, having played a major role in THORP's development and opening, was later to express the views that: "A business that once looked a sure-fire winner is beginning to look increasingly vulnerable ... BNFL's figures underpinning the plant's economic case have turned out to be incorrect in several important respects ... if the highly complex plant fails to operate to its projected standard, it will become a huge financial drain on the nation." [Harold Bolter 'Inside Sellafield' published 1996].

Accounts unpublished

That 'the highly complex plant failed to operate to its projected standard' as set by BNFL is beyond doubt. The full impact of these failures on THORP's profitability will however only be determined by the publication of a final 'set of accounts' for the plant. To date, no such figures



THORP reprocessing plant.

have been published since the plant opened in 1994 – as confirmed by a Government response to a parliamentary question in 2005 that 'BNFL has never separated the accounts for the THORP plant from other areas'.

Conveniently for those determined to continue to overstate THORP's viability, the final account is going to be a long time in coming for, in its FoI response to CORE, the NDA confirms that it "does not intend to make the financial information available at this time and have no plans for future publication. Ongoing commercial contracts make this information commercially sensitive". In other words, the world and his dog must wait perhaps until the 2070s when, for example, the contracted long-term storage of some 5000 tonnes of UK's AGR fuel is expected to end with its final disposal – or the last kilogram of plutonium is finally put out of harm's way for good.

CORE's Martin Forwood added: "That THORP's finances continue to be withheld from public scrutiny – despite its reprocessing days now being over – will suggest to many that, as well as failing to meet operational targets, the plant is already staring a negative financial outcome in the face. While ardent supporters will always find positives for THORP, its abject failure to meet BNFL's mission objectives cannot be one of them. We wait with interest to see the extent of verbal gymnastics employed by Government, NDA, Sellafield Ltd and others to divert attention from the commercial failures of what was once referred to by the industry as a flagship reprocessing plant."

Reprinted from Cumbrians Opposed to a Radioactive Environment website, 12 Nov 2018, <http://corecumbria.co.uk/news/sellafields-thorp-reprocessing-plant-an-epitaph-never-did-what-it-said-on-the-tin/>

UN nuclear weapons ban treaty spurs research on impact of nuclear testing

*Author: Matthew Bolton – International Disarmament Institute, Pace University (www.pace.edu/dyson/disarmament)
869.4761*

The International Campaign to Abolish Nuclear Weapons (ICAN) was awarded the Nobel Peace Prize in December 2017 "for its ground-breaking efforts to achieve a treaty-based prohibition" of nuclear weapons. But the Treaty on the Prohibition of Nuclear Weapons (TPNW), adopted at the UN by 122 governments earlier that year, is not only a ban treaty.

During the negotiations, a small team of ICAN campaigners also worked to ensure that the Treaty included "positive obligations" that address the ongoing humanitarian, human rights and environmental harms of nuclear weapons use and testing.

After the negotiations, ICAN's "PosObs" team, as we called ourselves, realized that ensuring implementation of the TPNW's provisions on victim assistance, environmental remediation and international cooperation and assistance required considerable further work.

As a result, under the auspices of Pace University's International Disarmament Institute, where I work, we have started doing research on how nuclear weapons use and testing have affected people and environments, focusing particularly on the Pacific region.

In January 2018, I travelled to Kiritimati (Christmas) Island where, along with nearby Malden Island, the UK and USA conducted 33 atmospheric nuclear tests between 1957 and 1962. British, Fijian, New Zealand and American veterans of the testing program and i-Kiribati civilians who lived on Kiritimati claim their health (as well as their descendants' health) was adversely affected by exposure to ionizing radiation. Their concerns are supported by independent medical research.

The UK and US testing program at Kiritimati relied on racist discourses that framed it, as a British military magazine put it, as a "lonely island ... boasting little more than a few coconut palms." But about 100 i-Kiribati civilians lived on Kiribati, employed by a copra plantation and the military base. The number increased to almost 500 i-Kiribati civilians by the end of the tests.

I spoke with Teeua Tetua, President of the Kiritimati Association of Cancer Patients Affected by the British and American Bomb Tests, who was a child at the time of the UK tests. "We felt uncomfortable every day," she said, describing the persistent anxiety caused by living on an island bombarded by nuclear detonations.

Teeua Tetua remembers gathering on the tennis courts in the village, in the middle of the night before a test. She said "the people were really afraid." She describes the blast as very hot and so loud that "people tried to put their fingers in their ears."

The Association has identified 48 survivors who experienced the tests first hand, as well as 800 descendants. Members of the Association report numerous health problems which they attribute to the testing, including blindness, hearing problems, cancers, heart disease and reproductive difficulties. They also report that their children and grandchildren have suffered similar illnesses. Survivors are "worried about the disease in their bodies," said Teeua Tetua.

In two reports we published in May – one on Kiritimati and one on Fijian test veterans^{1,2} – I outlined how the TPNW's positive obligations could offer a way to assist the people who are suffering from the impact of the nuclear tests in Kiritimati. While the British, US, Fijian and New Zealand governments have, to greater and lesser extents, responded to demands

from test veterans for recognition and assistance, i-Kiribati survivors have had little help or acknowledgement.

While the debate about helping civilian victims and test veterans has often been framed only in terms of compensation from the testing state, the TPNW frames assistance broadly, including "medical care, rehabilitation and psychological support, as well as ... social and economic inclusion" (Article 6[1]).

This means we do not need to wait for the nuclear-armed states to have a change of heart to help those people they harmed. Teeua Tetua said the desire for compensation was "not about money, but about doctors and medicine" – they need help addressing their health problems.

We can also think of more broadly remedial and restorative measures. For instance, we have learned from our research that many survivors want recognition of what happened to them. "It should be known by the world, the cruel things that have been done," Teeua Tetua told me. She says that there are few systems in Kiritimati for archiving and disseminating information about the impact of the nuclear tests and the potential health risks for those who may have been exposed to radiation. Association members have called for a monument in Kiritimati memorializing the suffering caused by the nuclear testing.

Recently, we have expanded our work beyond Fiji and Kiribati to research the impact of nuclear testing elsewhere in the Pacific. We are finding similar neglect of the needs of both civilian and military survivors and disregard for the rights of Indigenous peoples. But we also see the efficacy of the TPNW's holistic approach, rooted in humanitarian, human rights and environmental norms.

For example, in October, we published a report on Australia, authored by Dimity Hawkins of Swinburne University. She outlined the complex, overlapping histories of harm caused by the UK nuclear weapons program in Australia, from the detonations themselves, to uranium mining, displacement of Aboriginal communities and lands contaminated by fallout.³

Unlike Kiribati and Fiji, which have both signed the TPNW, Australia boycotted the negotiations and on 1 November was the only state subjected to nuclear testing by another other state to vote against a UN resolution calling for the TPNW's universalization.⁴

However, the framework offered by the TPNW's positive obligations offers a way for affected communities in Australia to seek solidarity from others around the world. I like to tell skeptics that the TPNW's provision on victim assistance has already had a normative effect, because it has made people at a university in New York pay attention to the impact of nuclear weapons on communities on the opposite side of the world.

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Western Australian uranium industry on the brink

Author: Mia Pepper – member of the Ban Uranium Mining Permanently (BUMP) collective of Friends of the Earth Perth; board member of the Mineral Policy Institute.

869.4762

Ten years ago the conservative Barnett government lifted the long-standing ban on uranium mining in Western Australia (WA). The government had promised “\$5 billion to WA’s gross State product” and “\$450 million a year.” Industry proponents promised jobs and bragged that uranium will be like “iron ore on steroids.”

The reality has been far more like morose miners on methadone. After a decade that has seen sustained Aboriginal and wider community resistance to mining plans, the uranium price plummet in the wake of Fukushima and a surge in renewable energy production, there is not a single operating uranium mine in WA.

Uranium exploration companies were a dime a dozen but just four projects surfaced as having potential in WA. Three of them raced through the environmental assessment process under the Barnett government and emerged with environmental, but not final, approvals just weeks before the state election in a clear move to wedge the incoming Labor government.

The McGowan Labor government felt the wedge and let the four mines with partial approvals continue – a clear breach of Labor’s pre-election promise not to allow mines to proceed unless they had full approvals. But the sustained low uranium price and community opposition has thwarted plans to develop any of the four mines.

Cameco has written off the entire value of the Kintyre project, Toro Energy has shelved its uranium plans and is now trying to strike lucky with gold, Cameco’s Yeelirrie project is the subject of a legal challenge by the Conservation Council of WA and three traditional owners, and then there is Vimy’s Mulga Rock project.

Vimy released its Definitive Feasibility Study for Mulga Rock earlier this year and the company is reported to be “confident of securing contract prices of about \$US60/lb this year or next for delivery in 2021 when it hopes to be in production with Mulga Rock.” There was supposed to be an investment decision by July but instead Vimy was handing out pay cuts and scaling back or bunkering down for the sustained lull in the uranium price (currently around \$US30/lb).

And while Toro is looking for gold – and other uranium companies have diversified into medicinal marijuana production or property development – Vimy is hedging its bets by setting up a subsidiary to explore for base metals.

Globally, 115 nuclear reactors are undergoing decommissioning – double the number under construction. The International Energy Agency is warning about the lack of preparation and funding for a “wave of retirements of ageing nuclear reactors” and an “unprecedented rate of decommissioning”. A growing number of countries are phasing out nuclear power, including Germany, South Korea, Switzerland, Belgium and Taiwan.



Walk against uranium, Western Australia, 2016.

The world’s most experienced reactor builder, Westinghouse, went bankrupt last year and the debts it incurred on reactor projects almost bankrupted its parent company, Toshiba. After the expenditure of at least \$A12.4 billion, construction of two partially-built reactors in the US was abandoned last year, and the only other reactor construction project in the US was almost abandoned this year after cost overruns of \$A14 billion.

No wonder that nuclear lobbyists are themselves acknowledging a “crisis that threatens the death of nuclear energy in the West” and are already writing eulogies about the “ashes of today’s dying industry”.

Nuclear power’s crisis has direct and obvious implications for the uranium industry. Only two mines uranium are operating in Australia – Olympic Dam and Beverley Four Mile – while mining has ended at the Ranger mine in the NT and ore stockpiles are being processed while work begins on a A\$1 billion rehabilitation.

The low uranium price is a symptom of a growing trend away from nuclear, a trend matched by increasing investment in renewable energy. Renewables generate 2.5 times more electricity than nuclear reactors worldwide, and the gap is growing rapidly. Even Dr Ziggy Switkowski – who used to be nuclear power’s head cheerleader in Australia – recently said that the window for large nuclear reactors has closed and that the cost comparison is rapidly diverging in favour of renewables.

It is with great optimism we look to great technological advancements made in renewable energy and hope to see the end of old and dirty energy like coal and nuclear. So we sigh with relief that there are no operating mines at Kintyre, Yeelirrie, Wiluna and Mulga Rock, that uranium from WA is not on its way to processing plants or reactors destined to become waste, a toxic legacy.

And we can celebrate those special places and unique ecosystems and continue, with watchfulness, to monitor the activities of those companies who have not yet seen the writing on the wall that uranium is uneconomic, unwanted and unsafe.

Nuclear lobbyists celebrate Union of Concerned Scientists' 'backflip' on nuclear power

Author: Jim Green – Nuclear Monitor editor

869.4763

Nuclear power advocates are celebrating the Union of Concerned Scientists' (UCS) new pro-nuclear position ... although the organization has not changed its position and is not pro-nuclear (or anti-nuclear).

A recent UCS report found that 22% of nuclear power capacity in the US is unprofitable or will soon become unprofitable and that greenhouse emissions will rise to the extent that nuclear is replaced by fossil fuels.¹ It thus offers support for broad policies that would in effect subsidize the ongoing operation of some nuclear plants as well as supporting other low-carbon technologies and policies. Support for nuclear subsidies is conditional on consumer protection, safety and security requirements, and investments in renewables and energy efficiency. On average, it would cost US\$814 million annually to bring unprofitable plants back to a breakeven point according to the UCS report.

So, should unprofitable nuclear power plants be subsidized if they meet the UCS's criteria? Dr Gregory Jaczko, chair of the US Nuclear Regulatory Commission from 2009–2012, doesn't think so. In a media statement, Jaczko said: "The Union of Concerned Scientist models don't reflect the reality of the United States electricity market. Renewables are getting cheaper faster than expected and are in some cases the least expensive source of electricity. In contrast, nuclear has only gotten more expensive. New nuclear is a financial boondoggle: the four new plants licensed while I chaired the Nuclear Regulatory Commission are costing billions more than projected, and two of them have been canceled after spending \$10 billion. Imagine how much carbon-free generation could have been deployed with that investment. Employing nuclear for climate change is like Dorothy seeking the Wizard of Oz to get home. It's an expensive enticing mirage."²

In any case, the substantive issues have been lost in a blizzard of fake news about the UCS allegedly shifting its position on nuclear power. Steve Clemmer from the UCS said "we are getting a bit more vocal" about the benefits of keeping nuclear plants open.³ That's as far as it goes – hardly a backflip and hardly momentous. Moreover, the UCS's support for keeping reactors online is highly conditional.

Nuclear advocate Mark Lynas congratulated the UCS for having "broken with the anti-nuclear ideology that has been part of the advocacy group's DNA since the 1960s" and said the organization "deserves great credit for having the courage to take this step."⁴ The Third Way pro-nuclear group said that: "Coming from an environmental NGO as respected and intellectually rigorous as UCS, this report is a big deal."⁵

The Breakthrough Institute argued that "opposition to nuclear energy from the institutional environmental movement has been monolithic, so this marks a decided change in the nuclear landscape".⁶ And the Breakthrough Institute piece, titled 'The dam has broken', suggests that other groups might follow the UCS's lead: "this sort of thing often happens slowly, even imperceptibly, and then all at once".⁶

Ted Nordhaus from the Breakthrough Institute said: "UCS is the first major environmental NGO to recognize that nuclear energy presently, and for the foreseeable future, is a key climate mitigation technology."⁷ (As we recently noted in *Nuclear Monitor*, the Intergovernmental Panel on Climate Change envisages nuclear power being a marginal climate mitigation technology, dwarfed by renewables.⁸) The UCS report is "particularly symbolic" and it marks a "remarkable shift", Nordhaus argues. He says it is likely but "by no means guaranteed" that other major environmental groups will follow the UCS's lead on the issue.⁷

A *Boston Globe* editorial argued that the UCS report is "symbolically, a really big deal" as the group's name is "practically synonymous with skepticism toward nuclear energy", and it is "hard to imagine a group with stronger historic anti-nuclear bona fides than the Union of Concerned Scientists".⁹

In fact ...

But in fact, the UCS has never been anti-nuclear – or pro-nuclear – and it hasn't changed its position. Alan Nogee, who worked at the UCS for 17 years, 12 of them as Clean Energy Program Director, noted in the aftermath of the release of the UCS report that:

- UCS has never called for a general closure or moratorium on nukes.¹⁰
- UCS left the Safe Energy Communication Council following the Chernobyl disaster, when the Council voted to endorse a moratorium on new nuclear power.¹¹
- UCS has rejected numerous requests to endorse shutdowns.¹²
- UCS has "worked to close or keep-closed-until-fixed, a handful of plants with specific safety and/or economic problems. It has rejected MANY requests from state & local groups to help close other plants or to support no-nukes laws."¹³
- The UCS always distinguished between the positive economics / climate impact of continuing to operate existing reactor versus the negative economics of new build, and the need to hedge against uncertainties as to the capabilities of energy efficiency and renewables.¹⁴

Alex Frank from the Hastings Group said of the UCS report: "In fact, UCS did not change its views on nuclear power. It did not support new nuclear construction. It did not support subsidies for any specific existing reactor. It did not conclude that every existing nuclear plant should stay open. It did not state that retired nuclear plants will all be replaced with fossil fuels. It did not urge scaling back support for renewable energy to allow for more support of nuclear. It did not minimize concerns about nuclear power safety or the lack of effective watchdog review by the Nuclear Regulatory Commission."

In an article titled 'Seven Things People Got Wrong with UCS' 'Nuclear Power Dilemma' Report, Clemmer said: "[D]espite reporting to the contrary, UCS has not changed its position on nuclear power. Has UCS advocated vigorously for policies to increase the deployment of renewable energy to address climate change? Absolutely. Have we been a longstanding watchdog for nuclear power safety? You bet. Do we now believe the Nuclear Regulatory Commission (NRC) is an effective watchdog or that nuclear power safety concerns are overblown? Emphatically no. But UCS has long recognized that the current nuclear fleet is a significant source of low-carbon power and that nuclear plants should not retire precipitously without carbon-free replacements."¹⁵

Clemmer said "some of the media coverage and statements by the nuclear industry and other groups have mischaracterized our report and our past work". The seven points he makes to correct the record are as follows:¹⁵

1. The report does not promote new nuclear power plant construction.

While new nuclear plants could be built under a national carbon price or low-carbon electricity standard, our modeling shows they are too expensive compared to new wind and solar projects, energy efficiency programs, and natural gas plants with carbon capture and storage.

*This isn't the first time UCS has shined a spotlight on the high costs of building new nuclear reactors. This 2016 UCS power sector deep decarbonization study found that nearly all nuclear and coal plants in the United States would be replaced by low-carbon technologies by 2050 under every scenario, except our "optimistic nuclear case."*¹⁶

2. The report does not advocate for subsidies for any specific nuclear plants.

As explained by UCS President Ken Kimmell in his recent blog, "the report does not argue for subsidies to any specific plants. That case will have to be made in state-specific forums. Should states decide to support nuclear power plant subsidies, our report calls for them to be temporary and subject to periodic reassessment. Companies seeking subsidies must open their books and allow the public and regulators to make sure that the subsidies are needed and cost-effective, and that the same level of carbon free power cannot be provided during the relevant time period with less costly options."¹⁷

Any subsidies also must be part of a broader strategy to reduce carbon emissions that increases investments in renewables and efficiency.

3. Existing nuclear plants must also meet strong safety standards to be eligible for support.

Since the 1970s, UCS has been a leading nuclear safety watchdog. The new UCS report recommends that nuclear reactors must meet or exceed the highest safety standards under Nuclear Regulatory Commission's (NRC) Reactor Oversight Process to be eligible for any policy or financial support. If the NRC weakens these standards, as proposed by the nuclear industry, UCS could no longer support this recommendation. At the same time, UCS will continue to push for better enforcement of existing regulations, the expedited transfer of nuclear waste from overcrowded cooling pools to safer dry cask storage, strengthened reactor security requirements, and higher safety standards for new plants. We also consider the NRC safety standards to be a floor, not a ceiling. States could encourage plant owners to make other safety improvements that go beyond current NRC standards.

4. Not every currently operating nuclear plant should stay open.

The report highlights examples where it might make sense to shut down existing nuclear plants that are saddled with major, reoccurring safety issues such as the Pilgrim plant in Massachusetts that Entergy is closing next year and the Davis-Besse plant in Ohio that FirstEnergy is threatening to close in 2020 if it doesn't receive subsidies. Other examples include Indian Point, due to its proximity to New York City, and Diablo Canyon, which is located near earthquake fault lines in California.

It also might make sense to shut down plants with high operating costs or ones that need to make major new capital investments to continue operating safely. Examples cited in the report include Crystal River in Florida and San Onofre in California, which were retired in 2013 following failed steam generator replacements.

5. Not every nuclear plant that retires early will be replaced with fossil fuels.

The report acknowledges that with sufficient planning and strong climate and clean energy policies, some existing nuclear plants can be replaced with renewables, energy efficiency, or other low-carbon technologies. For example, California passed legislation in September that commits the state to replace Diablo Canyon with zero-carbon energy sources by 2025. And states experiencing rapid wind and solar power deployment such as Iowa, Nebraska, Kansas, and Texas could potentially replace their nuclear plants with low-carbon energy sources over a reasonable period of time. However, a significant portion of the electricity in most of those states is still generated by coal and natural gas. Replacing those fuels with renewables and efficiency would result in much greater emissions reductions than replacing nuclear plants, another low-carbon source of electricity.

6. *UCS has long supported keeping existing nuclear reactors that meet high safety standards operating to combat climate change.*
7. *UCS has long supported a low carbon electricity standard (LCES), but not at the expense of renewable electricity standards (RES).*

Renewable standards have been effective at reducing emissions, driving down the cost of wind and solar, and creating jobs and other economic benefits for states and in rural communities. They have also been affordable for consumers. Including existing nuclear power plants in state renewable standards could significantly undermine the development of new renewables and all the benefits that go along with them.

We recommend including existing nuclear in a separate tier of an LCES, as New York state has done, to limit costs to ratepayers and avoid market-power issues due to limited competition among a small number of large plants and owners.

A long history of fake nuclear news

The portrayal – by some in the media and some nuclear lobbyists – of the UCS report as a pro-nuclear turn is false and it is wishful thinking. Such misrepresentation is common enough. Here are some examples:

In 2016, the *Wall Street Journal* said the Sierra Club was debating its position on nuclear power. Michael Brune, Executive Director of the Sierra Club, said the organization “remains in firm opposition to dangerous nuclear power” and that the media article “reflects wishful thinking on the part of the nuclear industry”¹⁸

The *Wall Street Journal* claimed that the Natural Resources Defense Council (NRDC) was working to keep two aging reactors online in Illinois. Henry Henderson from the NRDC said the newspaper was “dead wrong on our goals, focus and motivation” and that the organization’s efforts to reform energy policy “do not involve, or signal, a change in NRDC’s long-held concerns about the role of nuclear energy in the country’s generation mix.”¹⁹

In 2007, in response to a beat-up about environmental support for nuclear power, Fairness & Accuracy in Reporting (FAIR) reported: “Instead of a story about a growing fervor for nuclear power among some environmentalists, the story is really one about a growing fervor to resurrect nuclear power among corporate and political elites, aided by a handful of mainly environmentalists-for-hire.”²⁰

In 2014, the BBC (and others) falsely claimed that Friends of the Earth UK was turning in support of nuclear power.²¹

In 2009–10, the World Nuclear Association heavily promoted a dishonest article claiming that Greenpeace UK had changed its stance on nuclear power.²¹

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NUCLEAR NEWS

Don't dump on South Australia rally

On Saturday November 3, about 1,000 people gathered at Parliament House in Adelaide, the capital of South Australia (SA), for the 'Don't Dump on SA – We Still Say No to Nuclear Waste' rally.

Plans to turn SA into the world's nuclear waste dump were defeated in 2016 but the state is being targeted for a national nuclear waste dump by the conservative federal Coalition government.

Millions have been spent bribing local communities and tens of millions more are promised to the selected site – either in the Flinders Ranges or farming land near Kimba in the Eyre Peninsula.

The rally was held to send a clear message to the Federal Government to abandon the current abysmal site selection process and to the SA government to uphold state legislation that makes radioactive waste facilities illegal.

People travelled from the affected communities of Kimba on the Eyre Peninsula and the Flinders Ranges to join other South Australians concerned about the issue for a vibrant and colourful event of speakers and performers.

Eyre Peninsula resident Anna Taylor asked the crowd: "Why would you put radioactive waste in the middle of our food bowl when only 4% of our country is productive land?"

Adnyamathanha man Dwayne Coulthard said: "This process by the Federal Government is cultural genocide. We have had enough of being ignored. No radioactive waste dump on Adnyamathanha country in the Flinders Ranges. No waste dump in Kimba."

Dr Margie Beavis from the Medical Association for Prevention of War (MAPW) dispelled government scare-

mongering linking the practice of nuclear medicine to its dump plans. Nuclear medicine has not been hindered by the absence of a national dump nor will it be helped by the establishment of a dump.

President of SA Unions Jamie Newlyn said: "Minister Canavan came out recently and identified Whyalla, Port Pirie and Port Lincoln as areas where they could bring in nuclear waste. Those port communities in that logistics chain were all stunned by that announcement. The mayors of all of those communities are surprised that the announcement was made without any consultation."

"We're talking about this toxic, horrible nuclear waste coming through ports and across supply chains, across our boat links, across our highways and through our ports, that then it has to travel hours and hours by road or rail to a final destination, and those communities don't get a say either? That is a disgrace," Newlyn said.

A Friends of the Earth speaker noted that the plan to turn SA into the world's nuclear waste dump is still being promoted even though it lost support from major political parties in 2016. Two recent reports have promoted the plan to turn SA into the world's nuclear waste dump: one from a far-right politician and the other from 'ecomodernist' Ben Heard. Nuclear dumpsters aim to turn the SA into Australia's nuclear waste dump as a stepping stone to turning the state into the world's dump.

Other speakers included state Labor Party MP Eddie Hughes and federal Greens Senator Sarah Hanson-Young.

– Mara Bonacci, SA Conservation Council



“Asterix und das Atomkraftwerk” – the destiny and outreach of an Austrian pirate comic

Heinz Stockinger writes:

It is one of the most original, most cunning creations by the antinuclear movement: *Asterix und das Atomkraftwerk*, a pirate compilation of pictures taken from a dozen odd of existing editions of the French comic, with a new story told in the speech bubbles. While the Vienna street paper *Augustin* managed to publish an interview with the pirate author in 2006, he has remained anonymous even 40 years after the November 1978 referendum on Austria's nuclear power plant at Zwentendorf, 35 kilometres west of Vienna.

In the run-up to the 40th anniversary of this historic event this year, the Salzburg Platform Against Nuclear Hazards (PLAGE) has produced an exhibition titled *Asterix and the Nuclear Power Plant – the destiny and outreach of an Austrian pirate comic*.

The merits of this peculiar *Asterix* version are three-fold: Not only did it provide basic information (on radioactivity, safety, waste, lack of democratic decision-making etc.), but it showed people actually involved in action, thus encouraging readers to act. Thirdly, the amusing form of presentation afforded comic relief in a tense and conflict-prone public debate. Mr Uderzo and the German publishers were not amused, though. (Co-author Goscinny had died in 1977.) Complaints on copyright grounds were filed in Austria, as well as in Germany where the pirate comic had almost immediately taken on. (I remember donating 1,000 shillings – Austria's currency at the time – when two activists were fined 150,000 shillings for having sold copies at a street information stand in Vienna, some time after the 1978 referendum.)

It is this story of success and of prosecution that is told in parts 1 and 2 of PLAGE's *Asterix* exhibition. Its core is composed of selected scenes in which decisive moments of the struggle are called forth, or popular slogans put in the mouth of Asterix and Obelix and other figures, or on the banners they are carrying, often with a self-ironical note. Besides comments on those events and slogans, information is added on the political context, on some nuclear technical terms etc. Part 4 recalls how the comic was produced with the tools of pre-cut-and-paste times. In part 5, a quiz rounds off this pirate comic's journey from Austria to Spain and even Euskadi, via the Netherlands and other countries.

PLAGE has ‘unofficially’ presented the *Asterix* exhibition at this year's Nuclear-Free Future Award ceremony in the Great Hall of Salzburg University. It will be officially launched to the Salzburg media on December 15th.

P.S.: Inspiration for this exhibition came from ... the *Nuclear Monitor*! In autumn 2017, it announced that



the Laka Foundation, Amsterdam, was preparing an exhibition of original material and documentation on a comic named *Asterix und das Atomkraftwerk* and on how it had spread to other countries, an adventure completely unknown in Austria. That announcement immediately triggered the idea of an exhibition for the Austrian public, to be first presented on the 40th anniversary of the Zwentendorf referendum. An exhibition coming on 20 roll-up posters, well transportable, ready for use in a broad variety of educational and cultural facilities, and even on squares in town and the like. Without the Laka Foundation's original material, the PLAGE exhibition would not have been possible.

More information:

Dirk H. R. Spennemann, Oct 2015, 'Asterix und das Atomkraftwerk. Bibliographic Forensics of a German Underground Comic', Stichting Laka: Amsterdam, www.researchgate.net/publication/282696102_Asterix_und_das_Atomkraftwerk_Bibliographic_Forensics_of_a_German_Underground_Comic