
Ending the Fossil Fuel Era

edited by Thomas Princen, Jack P. Manno, and Pamela L. Martin

The MIT Press
Cambridge, Massachusetts
London, England

Contents

© 2015 Massachusetts Institute of Technology

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher.

MIT Press books may be purchased at special quantity discounts for business or sales promotional use. For information, please email special_sales@mitpress.mit.edu.

This book was set in Sabon LT Std by Toppan Best-set Premedia Limited, Hong Kong. Printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Ending the fossil fuel era / edited by Thomas Princen, Jack P. Manno and Pamela L. Martin.
Pages cm

Includes bibliographical references and index.

ISBN 978-0-262-02880-6 (hardcover : alk. paper) — ISBN 978-0-262-52733-0 (pbk. : alk. paper)

1. Fossil fuels. 2. Energy security. 3. Energy--Governmental policy. 4. Environmental degradation. I. Princen, Thomas, 1951-. II. Manno, Jack. III. Martin, Pamela, 1971-
TR318.E54 2015
553.2--dc23

2014034211

10 9 8 7 6 5 4 3 2 1

Preface vii

Part 1 The Fossil Fuel Problem 1

1 The Problem 3

Thomas Princen, Jack P. Manno, and Pamela L. Martin

2 The Biophysical: The Decline in Energy Returned on Energy Invested, Net Energy, and Marginal Benefits 37

Jack P. Manno and Stephen B. Balogh

3 The Cultural: The Magic, the Vision, the Power 53

Thomas Princen

4 The Ethical: A Fossil Fuel Ethic 97

Thomas Princen

Part 2 Keeping Them in the Ground 107

Introduction to Part 2 109

5 Leaving Oil under the Amazon: The Yasuni-ITT Initiative as a Postpetroleum Model? 119

Pamela L. Martin

6 Appalachia Coal: The Campaign to End Mountaintop Removal Mining 145

Laura A. Bozzi

7 El Salvador Gold: Toward a Mining Ban 167

Robin Broad and John Cavanagh

8	Slowing Uranium in Australia: Lessons for Urgent Transition beyond Coal, Gas, and Oil	193
	James Goodman and Stuart Rosewarne	
9	The Future Would Have to Give Way to the Past: Germany and the Coal Dilemma	223
	Tom Morton	
10	Heating Up and Cooling Down the Petrostate: The Norwegian Experience	249
	Helge Ryggvik and Berit Kristoffersen	
Part 3 The Politics of Delegitimization 277		
11	The Good Life (<i>Suñak Kawusay</i>) and the Good Mind (<i>Gamigohiboh</i>): Indigenous Values and Keeping Fossil Fuels in the Ground	279
	Jack P. Manno and Pamela L. Martin	
12	Exit Strategies	311
	Thomas Princen and Adele Santana	
13	On the Way Down: Fossil Fuel Politics in the Twenty-First Century	333
	Thomas Princen, Jack P. Manno, and Pamela L. Martin	
	Contributors	365
	Index	367

Preface

Throughout our academic careers, we coeditors have tackled issues of global environmental politics from the perspective of those who seek social and ethical transformation. At times we have put these efforts under the rubric of sustainability or sufficiency or decommodification or *buen vivir* (the good life). All aim at building good lives while living lightly on the earth. In Rio in 1992 at the Earth Summit, the UN Conference on Environment and Development, Jack and Tom participated in the work of nongovernmental organizations (NGOs) and documented their role in global environmental politics. In the early 1990s, Pam worked in Latin America, investigating how transnational networks for social change also changed world politics, all centering on oil and the Amazon. By 2010, the beginning of this project on the fossil fuel era, all three of us had turned to questions of diminishing energy resources and a post-fossil fuel future. Tom saw a localizing trend in the Global North—a shift in attention and action from the global, the abstract, the placeless to the local, the concrete, the place based. Jack and Pam both worked with Indigenous peoples (*Indigenous* as a capitalized term refers to groups of peoples, like *European peoples* or *North American nations*, with a common identity that involves historic claims to sovereignty and nationhood). Jack worked with Onondaga Nation in New York State as they strategized to prevent hydrofracking on their ancestral territory. Pam encountered conflict in the Amazonian rain forest as she came to know the people and their place, and the politics of the Yasuni National Park and the oil beneath it.

When the three of us came together for the long talks that eventually became shared writing, we realized that from our respective vantage points, each of us saw that a fundamental shift, at once biophysical and social, moral and spiritual, is underway. With every extreme weather event, every economic bubble bursting, every excuse for inaction on a

trend, see Michael Dougherty, "The Global Gold Mining Industry: Materiality, Rent-Seeking, Junior Firms and Canadian Corporate Citizenship," *Competition and Change* 17 (2013): 339–54.

This information on OceanaGold is based on our research and interviews not only in El Salvador but also in the Philippines in July and August 2013. This included fieldwork at OceanaGold's Didipio gold and copper mine in the northern Philippines. See John Cavanagh and Robin Broad, "The Real Cost of Gold in the Philippines," *YES! Magazine*, September 13, 2013, <http://www.yesmagazine.org/blog/John-Cavanagh-and-robin-broad>. On the Philippines, see also William Holden and R. Daniel Jacobson, *Mining and Natural Hazard Vulnerability in the Philippines: Digging to Development or Digging to Disaster* (New York: Anthem Press, 2012).

38. Catherine McLeod-Selzer, chairman of the Pacific Rim board of directors, interviewed in Karin Wells, "High Stakes Poker," *CBC Sunday Edition*, January 11, 2013.

39. From interviews in Wells, "High Stakes Poker."

40. See Robin Broad and John Cavanagh, "A Strategic Fight against Corporate Rule," *The Nation*, February 3, 2014.

41. See Santiago Humero Ruiz Grandadino, Estudio Comparativo del Impacto Economico de la Exploracion Minero Metalica vs el Impacto Economico de la Reactivacion Agropecuaria en la Zona Norte de El Salvador, ADES, Cabañas, El Salvador, June 2012.

42. The El Salvador case is not unique, as the case studies in this book reveal. However, it seems that the mainstream media invariably play up the "anti-" side rather than the positive alternatives being pushed.

8

Slowing Uranium in Australia: Lessons for Urgent Transition beyond Coal, Gas, and Oil

James Goodman and Stuart Rosewarne

If keeping fossil fuels in the ground requires a perceptual shift from viewing them as highly valued, net beneficial resources to seeing them as costly, planetary threats, then Australia's relationship with uranium mining illustrates both the possibility and the difficulty—perceptual and, especially, political—of making that shift. In this chapter, James Goodman and Stuart Rosewarne describe the cultural pendulum of legitimization, delegitimization, and, more recently, the possible relegitimization of uranium. They trace the history of ideas and actions of anti-uranium peace activists, labor unions, farmers, and Indigenous peoples who succeeded in convincing the Australian people and their government to impose a moratorium on uranium mining in the mid-1970s, a ban that lasted for almost thirty years. Australia's action demonstrates that a nation can choose to reject at least some of the enticing promises of easy wealth that can be had by taking stuff out of the ground, and do so based largely on nonmonetary ethical, spiritual, security, health, and human rights grounds.

This story adds a complication to the keep-it-in-the-ground (KIIG) argument: when it is implemented, the subterranean riches are still there, essentially free for the taking; a decision to ban is thus inherently unstable. Continuing to say no to extraction thus requires more than ethical righteousness; it requires a politics of co-creation alongside the resistance, building societal relations where people thrive on much lower levels of energy and material consumption, what Australian activists have only begun to engage. Lacking such a transformation, demand for fuel and power and the temptations of cheap extraction and costless externalization (what Australia knows all too well with its other mining operations, including coal) can easily overwhelm a decision to keep them in the ground. So here, although the pendulum swung toward uranium extraction in the early 2000s, it could well swing back to KIIG as the nuclear

power industry and citizens, the ones who ultimately pay true costs, face the twenty-first century reality of never-ending long-term waste storage problems, aging plants, and nuclear disasters such as Fukushima (see chapter 9 for Germany's reaction to Fukushima).

In these swings, there is a lesson for fossil fuels and extraction in general: irreversible processes that visit slow violence on both marginalized peoples and the planet as a whole are illegitimate; the time to start stopping is now.

Leaving fossil fuels in the ground currently means locking up what are defined as high-value assets. The International Energy Agency (IEA) states that two-thirds of the world's fossil fuel reserves must be permanently sequestered if climate stability is to be maintained.¹ To achieve a shift of this sort on a global scale means that fossil fuels must cease to be defined as resource assets and instead become recognized as liabilities that do untold damage when they are extracted and burned. Rather than be defined as a fuel, coal, oil, and gas must be recognized as health and climate hazards, a fundamental threat to human life and the environment. There are signs that fossil fuel industries, especially coal-fired power stations, are increasingly recognized as "stranded assets" and that this produces market volatility and investment uncertainty in the sector. The uncertain future for fossil fuels is discouraging risk-averse investment, yet change remains at the margins and piecemeal. The wholesale closure of fossil fuel industries, on the scale required by the IEA, remains elusive.

Uranium offers an example of an energy commodity that has undergone a similar transformation from fuel to poison. The transformation was achieved in large part by the anti-uranium movement, which reached its peak in the 1970s and 1980s. With the first experimental nuclear reactor in 1951, uranium was transformed into a valuable commodity, declared the fuel of the future. Countries with uranium deposits were suddenly enriched as suppliers to the new nuclear industry. Challenging the definition of uranium as a fuel, the anti-nuclear movement sought to recast it as a danger to humanity, a mineral to be left safely in the ground. The military uses of plutonium, the by-product of nuclear power, had been demonstrated to devastating effect at Nagasaki and Hiroshima and were subsequently played out in the Cold War arms race. From its inception, uranium as a commodity was stained by its association with weapons of mass destruction and with the nightmare scenario of nuclear holocaust. Even when distanced from its military uses, the

nuclear industry could never shake off concerns about public safety, of nuclear reactors and nuclear waste, and mining for uranium oxide, so-called yellowcake.

In this chapter, we argue that there are many lessons to be learned from the anti-uranium movement for developing strategies to leave fossil fuels in the ground. There are strong parallels between the political struggle in Australia to leave uranium in the ground and current efforts worldwide to phase out fossil fuel extraction. In both cases, the stakes are high. The apocalyptic scenario of runaway climate change, of making the planet uninhabitable, conveys much of the terror felt from the prospect of mutually assured destruction and the ensuing fallout and nuclear winter. Both climate catastrophe and nuclear holocaust are unimaginable and generate similarly visceral responses, including despairing for our planetary future. Also, in both cases the risk of global disaster is created by the consumption of mineral commodities for energy. Political contention centers on arguments against minerals extraction, whether uranium or fossil fuels, and instead for energy conservation and/or renewable energy.

The parallels end when we contrast the direct logic of human agency embedded in the prospect of nuclear weapons crisis—the finger on the button—and the more mediated logic of climate crisis. The threats they pose—planetary irradiation or climate catastrophe—are quite distinct and have their own separate logic. Reflecting this, nuclear power and fossil fuels are often presented as alternatives: expanded nuclear generation in India and China is driven in part by the desire to reduce reliance on coal-fired power and minimize greenhouse gas emissions; in contrast, in the aftermath of Japan's Fukushima incident in 2011 expanded use of fossil fuels has allowed a planned phase-out of nuclear power in Japan and in Germany. The dystopias offered by uranium and fossil fuels are set against each other as alternatives, as the only options on the table. More positive-sum possibilities offered for society by renewables, or by steady state and de-growth models, are ignored or foregone or postponed.

For this book's purpose of seeking a fossil fuel phase-out, there are strong similarities between the two issues and how they may be politically addressed. The merits in removing fossil fuels from the commodity chain and keeping them in the ground is the premise of our argument in this chapter, where we explore the Australian experience of leaving uranium in the ground. Australia's partial success was achieved principally through a government moratorium on expanded uranium mining, enforced nationally from 1983 to 1996 and at the State level until 2007. The process that led to the moratorium, its limits, and how it

subsequently unraveled, holds important lessons for instituting a similar ban on new mining and drilling for fossil fuels at the national level.

At the outset, a note of caution is required: sequestering fossil fuels, giving them up for safekeeping, presents much more of a challenge than sequestering uranium. Even in the scale of operations, we are not comparing like-with-like. The nuclear industry is a minor player in global energy when compared with fossil fuels. Nuclear energy accounts for almost 6 percent of global energy production; fossil fuels account for at least 80 percent.² World electricity production from uranium stabilized at about 2,700 terra watts in 2004 and remained at this level in 2012. Nuclear power accounts for about 12 percent of world electricity output, but this is concentrated in just six countries that together account for three-quarters of output: the United States, France, Japan, Russia, Korea, and Germany.³ In contrast, reliance on fossil fuels for electricity production is the global norm. The burning of fossil fuels accounted for three-quarters of global electricity supply in 1971, falling to two-thirds in 2010 (the fall being mainly due to the emergence of nuclear power). The three-fold growth in global electricity output from 1971 to 2009 translated into a tripling of coal-fired power output.⁴ Ideologically there are also important differences. Coal, gas, and oil are historically embedded as industrial fuels, positioned as normal (chapter 3); nuclear is presented as a successor fuel, but is also linked to immediate safety concerns and to nuclear weaponry and proliferation, and hence is relatively easy to delegitimize.

With these important caveats in mind, this chapter charts the origins of the national ban in the mid-1970s to its demise with the fall of the Federal Labor government in 1996. It traces the legacy of the ban at State level and in social movement mobilizations through to 2007 when the Labor Party (the ALP) returned to national power and officially repudiated the policy and instead re-legitimized uranium as an export fuel. The discussion contrasts with the experience after 2007, that is, after the ALP ban was lifted, with the moratorium period from the 1970s. The aim is to highlight the effectiveness of the moratorium in keeping uranium in the ground. During the period of the moratorium, several studies sought to demonstrate its negative impacts in terms of lost export earnings.⁵ In 2007, commenting on the lifting of the moratorium, the director of the Australian Uranium Association stated, "It is perhaps difficult for those not from Australia to appreciate the significance of the change this represents."⁶ The conclusion discusses this kind of government action as a strategy for halting the extraction of fossil fuels.

The National Moratorium

Australia's anti-uranium movement developed into a robust political force over the course of the 1970s and 1980s to have a decisive impact on government policy formulation. The movement secured broad popular support across the nation, and its momentum was maintained because of its focus on the community health effects of uranium mining and radioactive waste, and the role of uranium in the global arms race and in creating the prospect of nuclear war. The movement was also significant because it brought indigenous issues into the political frame. Indeed, the idea that Australia should leave its uranium in the ground became a national political issue in the early 1970s only with the discovery of large uranium deposits in relatively remote regions inhabited by indigenous peoples, in the Northern Territory (at Nabarlek and Ranger in 1969) and South Australia (at Roxby Downs, with copper and gold, in 1975). Deposits at these three sites accounted for up to 40 percent of worldwide economically viable uranium deposits at the time and were of added significance as the other large deposits were either already devoted to military uses, such as in the United States and Russia, or were located in unstable countries, such as South Africa.⁷ Australia offered a large-scale reliable supply of uranium for the world nuclear industry, said to be on the cusp of a boom in the wake of the 1973 oil crisis. This positioning makes it all the more remarkable that the anti-uranium movement was able to gain such political traction.

A small number of small-scale uranium mines had been operating in Australia from the 1950s, supplying uranium for the British and US weapons programs.⁸ Between 1955 and 1963, the British government operated nuclear test facilities in Australia, with twelve major explosions of atomic bombs and a further estimated 700 experiments with radioactive material.⁹ By the 1960s, the military market for Australian uranium had dried up. The Mary Kathleen mine in Queensland, for instance, opened in 1958 but was closed by 1963. Nonetheless, in 1972, in the closing days of the conservative Liberal-National Coalition government, new contracts for the export of uranium were approved. In 1973, the newly elected Federal Labor government, the first in office since 1949, imposed a ban on new exports of uranium primarily to gain leverage for an Australia-based uranium enrichment industry.¹⁰ As part of this strategy, in late 1974 the federal Labor government assumed a 50 percent stake in the Ranger project (through the Australian Atomic Energy Commission) and in 1975 announced a public inquiry. This

Ranger Environmental Inquiry was to be the first inquiry under the 1974 Environmental Protection Act and would be chaired by a senior judge, Justice Russell Fox (hence, dubbed the Fox Inquiry).

The announcement of the Fox Inquiry and the consequent prospect of large-scale uranium mining in Australia sparked extensive political mobilization. French nuclear weapons testing in the South Pacific in 1972 and 1973 had already begun to position Australian uranium as an environmental hazard, with unions imposing work bans on uranium exports to France.¹¹ Occupations against nuclear power stations in Germany, India's use of Canadian uranium in its first atomic bomb test, and in March 1975 a nuclear accident at Brown's Ferry in the United States set the international context. The Fox Inquiry itself was to proceed for more than a year, and its public hearings, where more than 300 people gave evidence, provided an important focus.¹² By 1976 a strong and broadly based movement had emerged, initiated by environmental organizations (notably Friends of the Earth and the Australian Conservation Foundation), encompassing churches, State branches of the Labor Party, some blue-collar trade unions and regional labor councils, and a range of professional bodies, including teachers, doctors, and scientists.¹³

The Australian Council of Trade Unions (ACTU) and the national conference of the ALP became central sites for advancing the campaign to stop uranium mining. As Cupper and Hearn outline, opposition to uranium mining cascaded through the labor movement from 1975, with an appeal from the environmental movement that the 1973 ban be maintained, and later from community-based coalitions such as the Movement against Uranium Mining and from indigenous groups affected by the proposed new mines.¹⁴ The uranium debate assumed central significance for the Labor government: some at the time likened the issue to that of the Vietnam War.¹⁵ In 1977, the ACTU stated that "no issue since conscription during the First World War—with the possible exception of Vietnam—has so split society."¹⁶ The movement quickly injected environmental concerns into a national minerals policy agenda. At the time, Australia was undergoing a minerals boom, and there was an intense political debate about the public benefits of expanded mining, especially in terms of revenues.¹⁷ The Labor government commissioned a report into mining finance, the Fitzgerald Report, that confirmed the drain on the economy and, acting on this, sought to buy back mining resources and support minerals processing in Australia. The government recognized the economic costs of dependence on extractive industries and that uranium mining was a politically contentious issue that, because of

the popular opposition to mining and the broader questions of human health and safety, could dominate the policy debate.

Under pressure from several unions, the ACTU became concerned about the health effects of mining and transporting uranium and the impacts of the nuclear cycle more generally. In September 1975 the ACTU resolved to proscribe trade unionists from working in the industry, pending the outcome of the Fox public inquiry. In May 1976, the issue was forced further up the political agenda when a Queensland railway supervisor was fired for refusing to permit the transport of material for the Mary Kathleen mine.¹⁸ Unions responded by launching a one-day national railway strike, and the industrial action could well have precipitated a national general strike had not the ACTU appealed to unions to postpone further action in line with its previous undertaking to await the assessment of the Fox Inquiry.

However, the labor movement's growing determination to block any further expansion of uranium mining was overshadowed by a more immediate pressing political challenge. In November 1975, the conservative Liberal-National Coalition used its control of the upper house to block the federal government's finance bill. With finance blocked, the business of government policy was completely frustrated, and this sparked a constitutional crisis. The governor-general dismissed the Federal Labor government from office and appointed an interim caretaker government led by the Coalition. With public sentiment running against Labor, a subsequent election resulted in the return of the Coalition to government. This proved to be highly significant because the Federal Labor Party, out of government, became more receptive to arguments against uranium.

The first report of the Fox Inquiry, published in October 1976, began by refusing to treat uranium as any other mineral, stating in the first sentence of its Preface, "Uranium is a very special metal: it contains fissile atoms."¹⁹ It recognized the risks associated with mining and exporting uranium, including in terms of the arms race, and urged that any decisions on approving mining be approached with caution and be subject to further public debate. Interestingly for today's debates about fossil fuels, it was the democratic argument that brought the inquiry closest to recommending a complete ban:

One of the arguments which has been used against any mining development is that, once it is started, no government will have the strength to resist pressures for its continuance and even its expansion. We believe this is a serious consideration. If the argument is a sound one, the proper course is to recommend against commencement.²⁰

The Coalition government claimed there had already been sufficient debate and immediately renewed the existing export contracts. The Fox Inquiry's second report, of May 1977, focused on the prospect for uranium mining at Ranger and reiterated its earlier concern on the need for caution in considering project approval. While it highlighted the risks of uranium mining, it also recommended mechanisms to minimize safety risks, and in the process, it effectively legitimized new mines.²¹

In response to the second Fox Report, the Coalition announced conditional support for expanded uranium exports and the opening of several new mines subject to the consent of local indigenous landholders. The Labor Party opposition opposed new mines while stating, "Existing contracts for uranium mining should be honored." Given that the coalition government had stated it would approve export contracts for the new mines, the Labor opposition acknowledged it would be required to honor them while committing to not approving any new operations.²²

Meanwhile, the anti-uranium movement had gathered momentum. By 1977, the link between environmental issues and peace concerns against uranium mining had become well established. Publications by the Australian branch of Friends of the Earth, such as *Ground for Concern*, but more especially the much-reprinted collection *Redlight for Yellowcake*, charted these linkages and articulated much of the urgency.²³ Although linked, the anti-uranium movement quickly subsumed and superseded the antiwar movement. By 1977, State-based groups had formed a national Uranium Moratorium movement behind a petition with a single demand for a five-year delay on uranium mining to enable a national debate. The petition was explicitly based on the Fox Report and foregrounded its security concerns about the risk of nuclear war; about theft, sabotage, or blackmail using radioactive material; and about the threat of nuclear waste. Concerns about broader environmental impacts and implications for indigenous peoples were cited but were not central.

The petition gathered 250,000 signatures, and in August 1977 more than 80,000 people demonstrated against the Coalition's decision to proceed with exports.²⁴ From June 1977, the movement sought to directly halt the export of uranium yellowcake that had been newly authorized by the federal government. Police violence at the docksides in Sydney and Melbourne led to work bans by waterside workers and an increased profile for the issue.²⁵ The anti-nuclear movement engaged local communities throughout much of Australia, and many local government shires and councils were enjoined to declare their local areas nuclear-free zones (and the Local Government Association was to maintain

its opposition to uranium mining into the new millennium). However, while such declarations remained an enduring symbol of the struggle, anti-uranium activism was not sustained. Dozens of local and workplace anti-uranium groups emerged through 1977, with most winding up by 1978. The vast majority had passed into history by 1980.²⁶ Notwithstanding the ephemeral nature of groups opposed to uranium mining, the anti-uranium movement was later rechanneled from the 1980s into the peace movement, centering on the intensifying arms race and nuclear weapons proliferation.²⁷

While short-lived, the anti-uranium upsurge had a direct and lasting impact on ALP policy. In 1977, reflecting the growing movement, the ALP position hardened into outright opposition to uranium exports. In July 1977 the ALP national conference declared a "moratorium on uranium mining and treatment in Australia" and repudiated all existing uranium contracts.²⁸ The stronger conference position reflected public concerns about nuclear proliferation and also about issues of mine safety, the safety of nuclear plants, and the issue of nuclear waste. This set of concerns had been raised at the Fox Inquiry and remained unresolved. In addition, there were concerns about the political impacts of the industry in terms of concentrated economic power and national security regulations that defined uranium mines as defense projects, where anyone threatening to boycott or advocating obstruction could be imprisoned for twelve months.²⁹ Despite these restrictions, at a special conference in 1978 the ACTU banned union labor from new uranium mines until "adequate safeguards" were in place for workers and for local indigenous people affected by the proposed mines (although it resolved not to impose work bans on existing contracts). In September 1979, following the March 1979 Three Mile Island nuclear meltdown in the United States, the position was reaffirmed with an ACTU Congress resolution against all uranium mining and exports (although not for enforceable work bans, enabling existing mines to operate and export). Given the political context, the resolution was then translated into the Labor Party's platform for government.

The Persistent Moratorium

In 1977 Mary Elliott and Friends of the Earth stated presciently that the ALP conference of July 1977 was a "decision of principle" that would "ensure the uranium debate goes on."³⁰ In many respects, the debate it initiated continued for thirty years, until the ALP fully reversed the

party policy in 2007. Yet even by the late 1970s, the ALP and ACTU positions had reached their high-water mark. With Nabarlek opening in 1979 and Ranger in 1980, the ACTU formally abandoned work bans from 1981, and the ALP's conference in 1982 resolved to "phase out Australia's involvement in the uranium industry" rather than repudiate it, preventing any need to legislate for closure. The ALP now was "not [to] allow any new uranium mines" (beyond Nabarlek and Ranger) but would consider approval where uranium was "mined incidentally to the mining of other minerals" (thus enabling approval of Roxby Downs). Mindful of its experience in government over 1972 to 1975, when big business constantly challenged the direction of Labor's management of the economy and the threat of capital flight engendered considerable economic uncertainty, the Labor Party sought to position itself as a responsible economic manager in the lead-up to the 1983 federal election. Caution framed the policy debate within the party conference, and the debate on uranium centered on the consequences of repudiating uranium contracts, said to be worth over \$400 million and whether investors should be compensated.³¹

While the new ALP policy sought to embrace a sense of caution as the premise of responsible management, the Coalition government had no such pretensions and was determined to preempt any moves to block the expansion of uranium mining by granting mining licenses and approving export contracts before the 1983 election. Here local indigenous land councils played an important initial role in delaying mining approvals. Indigenous consent to uranium mining quickly became a bargaining chip in the land rights debate. The Northern Territory Land Rights Act of 1977 (which, in 2013, still afforded the strongest rights for customary indigenous owners of any land rights legislation in Australia) gave veto power for local Indigenous people over mining development but then removed it for "national interest" projects, such as uranium mines. Reflecting this, the Act explicitly exempted the Ranger uranium mine from any local veto power, forcing the local land council to negotiate a deal.³²

In 1984, with Labor in government, the ALP Congress moved to endorse a "three mines policy," explicitly protecting Nabarlek, Ranger, and Roxby. The aspiration to phase out uranium mining was deleted, but new mines were prohibited, thus establishing a moratorium on the number of mine sites.³³ The policy was then entrenched as federal policy for the successive Hawke- and Keating-led Labor governments from 1984 to 1996. The national three mines policy also played out after a Coalition government was elected in 1996 because the federal

Coalition government could not override State rights, and, with Labor in office in key States, and these governments refusing to permit uranium exploration, the moratorium remained effectively in place until 2007. The Northern Territory was the exception because, unlike the State jurisdictions where governments possessed constitutional responsibility with respect to the issue of exploration and mining licenses, the granting of mining licenses in the Territory was the constitutional prerogative of the federal government.

The longevity of the moratorium is in itself remarkable, especially given the shift of the ALP in government to a more pro-market policy framework through the 1980s, and given the uranium industry's ongoing campaign for expanded mining. One explanation for this lies with the new, more dangerous nuclear standoff following the end of détente in the late 1970s. With the Soviet invasion of Afghanistan in 1979 and the rise to power of the Republican US presidency led by Ronald Reagan in January 1981, the world embarked on a series of new hostilities, dubbed the Second Cold War.³⁴ With Reagan in office until 1989, the 1980s were marked by rapid growth in the nuclear disarmament movement, not least in Australia.

During this period, the environmental concerns of the anti-uranium movement became more embedded in debates about the nuclear standoff.³⁵ In 1981 People for Nuclear Disarmament was founded in Melbourne, and yearly Palm Sunday peace rallies began in 1982, attracting close to 400,000 people by the mid-1980s. As political scientist Camilleri reported in 1986, by the mid-1980s Australia had caught "the same nuclear allergy that had struck much of the Western world," with upward of two-thirds of the population stating that the use of nuclear weaponry could never be justified.³⁶ Public concerns centered on nuclear weaponry and proliferation, defining a special responsibility for Australia as a uranium supplier. The nexus was expressed in the 1984 Independent Committee of Inquiry into Nuclear Weapons and Other Consequences of Australian Uranium Mining, which sought to update the Fox Inquiry process in the context of the new federal Labor government.³⁷ The 1986 Chernobyl accident confirmed the already firm public opposition to Australian participation in the nuclear cycle.

Nuclear Boosterism

As long as the Cold War proceeded and concerns about nuclear safety prevailed, it was difficult for uranium to be treated as just any other

mineral commodity. With all its human and environmental risks as a radioactive mineral with vast destructive capacity, potentially causing a pall over millennia to come, uranium could not easily be treated as a mineral on a par with, for instance, iron or gold. The struggle for the industry, and for the government, was to shed uranium of its risky associations. One way to achieve this was to establish a distinction between peaceful and military uses of uranium and impose requirements that Australian exports of uranium only be used for peaceful ends. This approach was pursued with an approvals and monitoring framework established in the 1980s. As early as 1984, the Hawke Labor government was arguing that the export of uranium from Australia contributed to world peace by empowering Australia to argue for disarmament. Speaking in Moscow in 1984, the Australian foreign minister stated:

The simplest way to ensure that no Australian uranium is ever used in a nuclear weapon—so the argument goes—is to keep it in the ground. But ... curbing off the supply of uranium will not have any effect in reducing the number of nuclear weapons in the world. It will seriously damage arms control and disarmament and it could deal a serious blow to the single most effective arms control and disarmament measure in effect at the moment—the Nuclear Non-Proliferation Treaty.³⁸

Another way of normalizing uranium was to diminish the salience of military uses and delegitimize other sources of energy. The end of the Cold War reduced the intensity of the military threat, although the issue of nuclear proliferation remained. The intensification of concern about global warming as caused by the burning of fossil fuels repositioned the nuclear industry, once again, as the fuel of the future. Nuclear energy could now be presented as clean energy, entailing lower risks in comparison with fossil fuels. This was a political gift for nuclear advocates.

Despite the end of the Cold War, the ALP maintained its moratorium at the national level. Pro-uranium advocates sought to have the moratorium lifted in 1994 and 1998, but they failed due to concerns about maintaining ALP political unity. Public concerns remained in place and could resurface unexpectedly, for instance, in 1995 when France resumed its nuclear testing in the Pacific. Here the Labor government was forced to respond to public disquiet but did so claiming that Australian uranium sold to France was used only for peaceful ends.³⁹ As noted, when Labor lost the federal government in 1996, State Labor governments continued to maintain a ban on new uranium mines. The State bans frustrated the development of new mines.⁴⁰ More important was the expansion of uranium mining at the approved mines, especially at Roxby,

later renamed Olympic Dam. With known deposits of 1.5 million tons, Olympic Dam is the world's largest uranium deposit and has expanded production.⁴¹ Indeed, it was the expansion of output at Olympic Dam that was largely responsible for the doubling of uranium exports between 1996 and 2007, to about 10,000 tons per year.⁴²

Meanwhile, the federal Coalition government focused its efforts on promoting the expansion of uranium mining in the Northern Territory. With the constitutional authority to make determinations with respect to mining in the Territory, the federal government was able to override local-level political priorities, although in practice, the incumbent conservative Country Liberal Party had been promoting uranium for many years. However, the Coalition government's moves served to revitalize the anti-uranium movement. With new purpose, anti-uranium campaigning focused on reengaging popular opposition and on leveraging with local indigenous communities and through international institutions. The key point of contention was the proposed Jabluka mine, to be located near the Ranger uranium mine in what had become the Kakadu National Park (partly as a result of the Fox Report). With local indigenous people able to make claims through land rights legislation and with Kakadu listed as a World Heritage site under UNESCO, plans to mine uranium were forced into abeyance by Indigenous and environmental campaigners, driven by a mixture of dogged determination and strategic maneuvering. The Jabluka campaign began in 1996 and ended only in 2002 when mining giant Rio Tinto acquired the site and resolved that the cost of overriding Indigenous opposition was too high in terms of reputational capital.⁴³

The New Millennium Uranium Pursch: An Energy Supply Nation

From the mid-2000s, a succession of governments of both political persuasions embraced the economic promise of uranium mining. They joined the chorus of industry in seeking to rehabilitate uranium mining, arguing the case for nuclear power as a source of clean energy as well as contributing to medical advances. With Australia as the world's pre-eminent exporter of coal, rivaling Saudi Arabia in terms of the value of exports of fossil fuels,⁴⁴ successive governments contended that adding uranium to the export mix would be critical to positioning Australia as the foremost source of the world's energy resources.

Toward this end, support for a range of proposed new mines and the establishment of a waste dump that would receive imported uranium

waste prefigured a uranium renaissance in Australia in the 2000s. From 2005 the conservative Coalition government signaled that it would relax restrictions on the exploration and mining of uranium. In February 2006, the Coalition hosted the G20 meeting and nominated energy security as one of the key issues to be addressed. Chairing the event, the Coalition Treasurer declared Australia's pivotal role in "an energy and minerals freeway linking suppliers and consumers across the globe."⁴⁵ The government was clearly seeking to position Australia as an energy superpower, as potentially the world's largest uranium exporter as well as the largest coal exporter. World leadership in the export of gas was also part of this agenda. The government's clean energy alternative to the Kyoto Protocol, the 2006 Asia-Pacific Partnership on Clean Development, neatly expressed this geo-energy ambition. Alongside the establishment of a Low Emissions Technology Development Fund that would underwrite research and investment in clean coal technology, the growth of nuclear power—and the expanded mining of Australian uranium—was claimed by the Coalition government, and also supported by the successor Labor government's minister for energy and resources, to be a critical aspect of the "clean energy" mix.⁴⁶

In the process of promoting nuclear power, the Coalition government commissioned a number of federal public inquiries, all headed by nuclear power advocates: a joint industry-government committee, the Uranium Industry Framework, in August 2005, chaired by John White who had a direct interest in companies that invested in uranium enrichment and had lobbied the government to support a nuclear enrichment plan at BHP-Billiton's Olympic Dam uranium mine; the Uranium Mining, Processing and Nuclear Energy Review in May 2006 chaired by Ziggy Switkowski, who himself was chair of the Australian Nuclear, Science and Technology Organisation; and the House of Representatives Standing Committee on Industry and Resources Inquiry into Australia's Uranium, chaired by well-known pro-uranium politician Geoff Prosser. One obvious consequence was a rush of expressions of investment interest from energy companies and state-owned enterprises from Canada, China, France, India, and Japan to explore and mine uranium in Australia.

The Coalition government also sought to secure a place on the "energy and minerals freeway" by signing onto the Global Nuclear Energy Partnership. The Bush administration had proposed a partnership of suppliers and users with a view to developing a "worldwide consensus on enabling expanded use of economical, carbon-free nuclear energy," in effect bypassing Nuclear Non-Proliferation Treaty (NPT) obligations

and the International Atomic Energy Agency (the Global Nuclear Energy Partnership was subsequently renamed the International Framework for Nuclear Energy Group).⁴⁷ The Coalition had already acceded to the terms of this alternative institutional framework, outside the NPT, by endorsing the sale of uranium to Taiwan. This was in line with and followed the US administration's decision to supply nuclear technology to Taiwan, despite Taiwan's not being covered by the NPT (as a nonmember of the United Nations, Taiwan cannot be an NPT signatory, although it is subject to an International Atomic Energy Agency [IAEA] safeguard agreement). When Australia joined the Global Nuclear Energy Partnership in 2007, it was also signing onto the Partnership's commitment to creating a closed fuel cycle, where suppliers would not only provide new fuel but would also agree to contaminated waste being returned to the uranium-source country.

Surprisingly, the Taiwan uranium export deal attracted little opposition within Australia. This was perhaps because the contract between BHP Billiton and Taipower was organized as an indirect sale arrangement: uranium would first be shipped to the United States for enrichment before being transhipped to Taiwan, and the arrangement was sanctioned through an Australian-US bilateral agreement.⁴⁸ The lack of debate may also be explained by the prior resolution of an earlier debate about the sale of uranium to China.⁴⁹ The prospect of Australian uranium being sold to China had aroused considerable concern even though China is a signatory to the NPT (whereas Taiwan is not). There were lengthy deliberations in the parliament, and some of the concerns were dispelled with the Coalition determining that a firm condition of the export contract would be that uranium could be used only for peaceful purposes and this condition would be monitored by the IAEA.⁵⁰ Officials in the Australian Safeguards and Non-Proliferation Office called into question this monitoring arrangement, as the IAEA does not have the authority to track the movement of uranium, although the parliamentary committee that endorsed the arrangement to export uranium to China recommended that Australia fund the IAEA to police the contractual obligations.⁵¹

A more politically contentious situation emerged following the Bush administration's decision to provide India with nuclear technology for civilian purposes. The refusal of India to accede to the NPT represented a real challenge to successive Australian governments' commitment to the terms of the Treaty and whether it should consider taking advantage of the US rapprochement with India and approve the export of uranium to

India. Initially the Coalition declared that it would stand by its commitment to the NPT and not entertain the possibility of supplying uranium to India. But this position was soon abandoned on the grounds that the controls proposed in the US-India bilateral agreement provided the necessary safeguards and that planned inspection arrangements would draw India under an NPT-like umbrella.

The election of the Rudd-led Labor Party government in November 2007 heralded a potential retreat from the Coalition's rehabilitation of uranium mining. Rudd was committed to the NPT and suspended the agreement to export uranium to India. However, at its April 2007 National Conference, the Party abandoned its three mines policy, the culmination of an unfolding retreat from the Party's previous commitment to the moratorium on any expansion of uranium mining. In 2011, and in line with this policy retreat, the ALP set aside its opposition to the sale of uranium to India following the Nuclear Energy Suppliers Group resolution to exempt India from a ban on the supply of uranium. Rudd's successor as prime minister, Julia Gillard, argued that there was little logic in prohibiting exports to nonsignatories to the NPT when other uranium producers could supply India, and the Labor Party's 2011 national conference fell into line, abolishing the policy proscribing the supply of uranium to nonsignatories to the NPT.⁵² A not-altogether-different set of circumstances shadowed deliberations over whether to ratify an earlier Coalition agreement to permit uranium exports to Russia: in the face of criticisms that Russia was being politically singled out, the Labor government had approved the agreement in 2010.⁵³

While diplomatic and strategic concerns were critical in this export drive, economic considerations had also been important. The commodity boom had captured the Labor Party, and the Rudd Labor government's minister for energy and resources, in particular, was an enthusiastic advocate for adding uranium to the resource export mix. Minister Martin Ferguson commissioned the Bureau of Resource and Energy Economics to review the potential of the global uranium market in anticipation of a nuclear power boom in the Asia-Pacific region.⁵⁴ The potential markets included nonsignatories to the NPT, and from 2011, uranium supply deals were being explored wherever there was an opportunity to outcompete rival exporters. In 2012, for instance, the Labor government agreed to export uranium to the United Arab Emirates (UAE)—ahead of other potential suppliers such as Kazakhstan and Canada—and the government anticipated that this would become a springboard for negotiating other uranium supply agreements in the Middle East (the UAE

had concluded agreements with Korea to construct two nuclear power reactors with plans for two more).⁵⁵

A second critical element in this campaign for a nuclear energy future was the Labor government's decision to affirm the Coalition plan to establish a radioactive waste dump in Australia. This, it was argued, would integrate the import of nuclear waste as part of the uranium trade cycle and would greatly strengthen the attraction of Australia as a uranium supplier. Just as the commitment to promoting uranium mining and exports was argued to reflect Australia's comparative advantage in uranium, so the argument that nuclear waste could be deposited in a geologically stable and remote location was represented as another dimension of the nation's comparative advantage. Imports of nuclear waste were to complement Australia's international trade closing the circle of the uranium commodity chain.

Post-2007: Local Mobilization Disrupting the Uranium Rush?

The mounting federal enthusiasm for uranium mining and export forced the environment movement to rethink its strategic focus. With almost no traction in the federal political sphere, the environment movement turned its energies to testing the scope for stopping mining development through the environment and conservation legislative framework. Resources were directed to evaluating planned projects to expose the local environmental and social impacts of new mines and to scrutinizing and questioning the merits of the environmental impact assessments. Governments were also pressured to extend the frames of reference of impact assessments to include cultural concerns, particularly as these relate to Indigenous communities. Since 2012, impact assessments have been required to provide greater reflection on cultural issues, and this has been especially important given that uranium deposits are generally located in remote areas on traditional Aboriginal lands.

Anti-uranium movements have also turned their attention to lobbying State governments. With the exception of the campaign to block the uranium waste facility being established at Muckery in the Northern Territory, a federal government responsibility, campaigns against uranium mining have concentrated on lobbying State governments when State governments are assessing applications for exploration and mining approvals. This, however, has not been particularly successful, especially with the election of pro-uranium Coalition governments in place of Labor governments across the country. In 2008, for instance,

the incoming Liberal government in Western Australia lifted a previous ban on uranium exploration and three new uranium mines—Comeco's (formerly BHP Billiton's) Yeeliree, Lake Maitland, and Lake Way—were scheduled to start production by 2014. The Australian Conservation Foundation (ACF) held out the hope that it might stop an incoming government in Queensland from following the lead of the Western Australian government, securing assurances from the two competing parties that they would not lift the ban on mining, but the trouncing of the Labor Party at the election handed the conservative Campbell Newman government such a large majority in 2012 that it immediately announced it would not honor its written undertaking to the ACF. The Coalition government in New South Wales, which had held the line against uranium mining, quickly followed suit and lifted restrictions on exploration.

Still, the lack of traction in lobbying efforts of State governments has not been confined to instances where the Coalition party governs. This was demonstrated in the struggle against the approval of BHP Billiton's plans to develop the Roxby Downs mine to establish what would be the world's largest open-cut uranium mine, the Olympic Dam project. The environment movement was pitted against a State Labor government in 2008 when BHP Billiton announced that it wanted to invest \$30 billion to expand the Roxby Downs underground mine into a massive undertaking, expected to extract and export up to 19,000 tonnes of uranium as well as recover copper, gold, and silver.⁵⁶ Both the federal and Labor-led South Australian governments indicated their support for the proposal, and in 2009 BHP Billiton submitted a draft environmental impact statement (EIS) for planned substantial expansion. There were 4,000 public submissions in response to the EIS, and the great majority of these identified innumerable negative environmental impacts. The new mine would require an additional 200 million liters of water per day to be drawn from the Great Artesian Basin, which itself feeds Lake Eyre, and flow rates are declining. A proposed desalination plant would release saline brine into the Upper Spence Gulf, potentially damaging the marine ecosystem and threatening unique breeding grounds. Energy consumption would draw on 20 percent of South Australia's electricity capacity and result in a dramatic increase in greenhouse gas emissions.⁵⁷ The environmental concerns were well documented; even the company acknowledging the leakage of radioactive waste into the underlying rock and the aquifer (BHP Billiton 2011). Although the 2009 EIS understated the company's ambitions, the company issued a revised version, and

both the federal and South Australian Labor governments approved the project on 10 October 2011.⁵⁸

The reorientation in the political focus of the anti-uranium movement is not new. It builds on longstanding practices of mobilizing locally in the face of governments' pro-uranium stance. Indeed, when the pro-uranium Coalition government was elected to office in 1996 and approved applications for new mines and the expansion of existing mines, anti-uranium campaigns concentrated on canvassing support within local communities to lobby government. The campaigns were more often than not initiated by State or Territory-based organizations, principally conservation councils.

A key feature of these campaigns was their attention to environmental and community safety concerns and the failure of mines to abide by set environmental guidelines. Campaigns were focused on exposing the repeated incidences of leaks, spills, and accidents, emphasizing the fact that uranium could not be produced safely. In the process, activists examined the records of some of the uranium mining companies' overseas operations to highlight systemic shortcomings in their safety records.⁵⁹

Coalition building was also a crucial feature of these endeavors to reignite the anti-uranium movement, as were decisions to inject a more confrontational dimension into campaigns through direct action and acts of nonviolent civil disobedience. As well, engaging Indigenous communities figured prominently in these endeavors. In 1998, for instance, a coalition of forces, initially coordinated by the Mirrar people, the customary Aboriginal landowners, and the Australian Conservation Foundation, launched national protests to block approval for the proposed Jabluka mine in the Northern Territory. Notwithstanding Coalition support for the project, the sustained campaign forced the indefinite postponement of the project, although the collapse in commodity prices was a contributing factor because lower prices made the project less viable.⁶⁰ In fact, this success set the pattern of the movement against uranium mining for the next decade. Streled by the success at blocking Jabluka, another direct action campaign was launched against the proposed Beverley uranium mine in northeast South Australia.

Direct action protests have been designed to rouse support among the general population. The Sleepy Lizard Revenge march, from July 14 to July 20, to convene at the Olympic Dam site, drew on traditional Indigenous iconography to signal the common purpose of local Indigenous communities and the activists drawn from urban centers.⁶¹ The potential

for legal action had been explored, with traditional elder Uncle Kevin Buzzacott pursuing action to halt the expansion in the federal court, on the grounds that the federal minister for the environment had failed to consider crucial environmental factors.⁶² That action proved unsuccessful, although, as outlined below, subsequent uncertainty about the future of the nuclear industry later prompted the company to shelve its expansion plans.

Indigenous communities and activists played a key role in these campaigns, which in the main centered on halting the mining, the occupation, and contamination of traditional lands in remote Australia. Indigenous groups began to assume a more prominent, if not leading, role in defining campaigns against uranium mining. A key concern has been the potential impact on traditional lands, on Indigenous country. For instance, following government approval for the Canadian company, Uranium One, to develop the Honeymoon mine in South Australia, the Adnyamathanha traditional owners appealed for greater transparency in the approval and oversight process of what was happening on Yarta land. At the Olympic Dam uranium mine, elders from the Araburna community were resolute in their campaign to protect their country from the expansion of mining. The Araburna nation, for instance, petitioned the government to have Lake Eyre declared a World Heritage site as a strategy to block further development of the Roxby Downs mine. Indeed, Indigenous leadership and involvement in the movement against uranium mining became an essential feature of the contemporary political focus for movements against uranium mining. As a result, Indigenous cultural concerns were woven into the anti-uranium mining narrative, alongside ecological and safety considerations.

The assertion of Indigenous rights has also been at the forefront of efforts to block the federal Labor government plans to establish a radioactive material waste repository in the Northern Territory. Local Indigenous landowners at the Muckkary cattle station, where the proposed dump is to be located, launched a national campaign in 2009 against the proposal. With support from various environmental activists and trade unions, the Muckkary people toured major urban centers canvassing support to stop the proposal. They questioned the legitimacy of the negotiations and the authority and right of those with whom the government had been negotiating to speak on behalf of all of the Muckkary traditional owners. Following a petition by five groups of traditional owners, the government proposal became the subject of federal court action, and the matter was heard in 2013. In the meantime, popular opposition to the

Muckkary waste repository proposal continued to build, steeled by the successful campaign by the Kupa Piti Kungka Tjura to check the idea of a nuclear dump being established in South Australia, and by strengthening union support, with leading Northern Territory unions, notably the Maritime Union of Australia, declaring their intention to stop the project from proceeding. Confronted by this concerted campaign and facing possible defeat in the court, the government announced on June 19, 2014 that it would not proceed with the proposal.

While environmental movement campaigns against uranium mining have been buoyed by engagement with traditional custodians of the land, differences of opinion within Indigenous communities on the economic benefits, or otherwise, of mining or waste dumps could deliver to these communities have highlighted the divisive impact of uranium mining. Several national-level Indigenous councils, frustrated with the impoverishment of Aboriginal communities in remote Australia, regard the development of uranium mining projects or the establishment of waste sites as bringing considerable economic advantage to these communities. The Central Lands Council, an Indigenous representative body at the regional level, for instance, supported the Angela Palmer uranium mine near Alice Springs in central Australia, setting aside the opposition of local traditional landholders to the project. Likewise, the Western Desert Land Aboriginal Corporation has supported Cameco's Kinyre Rocks project in Western Australia in the face of the reticence of the local traditional custodians. The Northern Land Council has endorsed to the Muckkary waste site proposal in opposition to the local people.

Governments and mining companies have been quite effective in selling the message that Indigenous endorsement of mining will provide remote Aboriginal communities with a sustained income flow and a potential source of employment. Where they have not been successful in persuading Indigenous landholders, they have had few qualms in riding roughshod over local opposition. One example was the West Australian government's refusal to meet Indigenous elders' demands for a more thorough environmental and cultural impact assessment of the Yeelirrie uranium mine project. Notwithstanding these defeats, there has been one successful campaign to stop any development of a uranium deposit at the Koonagarra deposit, with the site being incorporated into the Kakadu National Park in 2011 in line with the wishes of the traditional land custodians.⁶³

Such successes are limited and localized, but are remarkable given that the full force of the state and the corporate sector has been mobilized

in support of uranium. As such, the successes are highly symbolic and have revitalized opposition to uranium mining. The Muckatjy campaign in particular has proved a catalyst in bringing fresh impetus to the movement. By linking the dangers of embracing the uranium cycle with the assault on Indigenous rights, the campaign has steered a new determination to campaign against the thrust of the Labor government's policies. One aspect of this has been a strengthening of coalition building across different social movements and faith groups in order to bolster local opposition to the waste dump. A new grouping, the Choose Nuclear Free project, for instance, was formed in 2011, bringing twenty-seven nongovernment organizations together, including leading environmental and public health and State conservation councils. Member groups have declared their determination to maintain the fight against uranium mining and, working with the Muckatjy campaign, block the establishment of radioactive waste facilities.⁶⁴ In the process, concerns with securing and maintaining the cultural integrity of Indigenous communities, of defending connection with Indigenous lands, have become as important as the defense of ecological integrity and environmental and safety issues in challenging the notion that uranium is a commodity like any other.

This campaign to block the establishment of a nuclear waste storage facility has proved important in other respects. It has exposed the dangers of uranium mining and of the long-term consequences of the government's support for mining and its decision to accept the import of nuclear waste as part of the ambition of selling Australia's comparative advantage in the international trade in uranium. This commitment to the storage and sequestration of nuclear waste, as another stage in the uranium commodity chain, refocused the attention of the environmental movement, trade unions, and civil society organizations on ending Australia's involvement in this international trade. The many groups that have endorsed the New South Wales Uranium Free Charter, for instance, are set on working toward stopping uranium mining, to keeping uranium in the ground, and, in effect, to abolishing the commodification of uranium.⁶⁵ Government efforts to bolster uranium sales by welcoming waste to Australian shores had clearly started to backfire.

The Movement against Uranium Mining and the Force of the Market

The ALP's 2007 decision to renege on its 1977 moratorium on new uranium mines, now backed by Labor parties in all State jurisdictions and the Northern Territory, has led to a significant expansion in uranium

mining in Australia. The Australian government has begun to openly compete with other uranium-exporting countries by abandoning the NPT and offering the prospect of establishing a new import trade for nuclear waste, destined for Indigenous communities in central Australia.

Paradoxically, as the movement against uranium mining struggles to influence government policy, the uncertainties in the global economy could prove a more powerful obstacle to the industry's future expansion. In August 2013, BHP Billiton announced the postponement of the Olympic Dam project. BHP Billiton also disposed of its Yeeliree mine, which it sold to the Canadian company Comeco. The company blamed escalating costs in getting projects off the ground and softening uranium demand and prices. It has also become apparent that the company was overly optimistic in assuming that the leaching technology that was being tested, as a substitute for the more expensive smelting process, could be scaled up to the required production level. There was no guarantee that the technology would be available in the immediate future, let alone what the cost would be.⁶⁶ Nor is the postponement of the Olympic Dam project a unique event. There are, in fact, a number of projects that have been put on hold, including Comeco's Yeeliree mine.

However, while growing uncertainty in the global uranium market may prove the undoing of the Olympic Dam expansion project, it would be wrong to simply attribute the decision not to proceed to erroneous accounting forecasts. Indeed, the softening uranium demand and prices reflect mounting global concerns about the risks associated with nuclear power. The Fukushima meltdown has been a critical factor in this. As well, reports of leaks and mishaps at other nuclear installations in Europe and the United States have underwritten concerns about the risks of nuclear power and strengthened the political voice of the antinuclear movement. Global campaigns to halt the engagement with nuclear energy have in fact resonated on international commodity markets.

Despite these international developments, the Australian government has remained resolutely committed to the expansion of uranium mining. The Labor government's resources minister continued to champion uranium as part of the resources export mix and even as a source of energy within Australia.⁶⁷ When BHP Billiton extended its Olympic Dam indenture agreement through to October 2016, its chief executive officer, Marius Kloppers, was reported as saying that the Federal and South Australian governments had been "fabulous" in backing the project, presumably in the hope that global demand and market prices for uranium will rebound.⁶⁸

Notwithstanding government support, uranium and the nuclear industry remain high risk. In 2007, Michael Angwin, the director of the Australian Uranium Association, delivered a triumphalist speech to the World Uranium Association declaring an upcoming nuclear renaissance in Australia with the lifting of the ALP moratorium, claiming public support for uranium in every State and Territory. BHP Billiton's decision to postpone development of uranium mining at Olympic Dam because of the collapse in commodity prices suggests that the promise of the nuclear renaissance might well be wishful thinking. The Fukushima meltdown and the concerns in Japan that another nuclear plant is sitting on a fault line and will probably have to be shut down, along with the regularity of accidents reported at nuclear power stations throughout the world, have raised serious questions. The viability of nuclear power as an alternative to fossil fuels is now put seriously in question, and confidence in a nuclear future is severely shaken. Even if the federal government is able to proceed with the Muckaty waste disposal site, which now looks increasingly unlikely, Muckaty would be far from an adequate solution to the problem of nuclear waste. The withdrawal of federal funding to develop waste storage facilities in the United States indicates that the problem of safe and effective waste management is virtually, if not actually, insoluble.

Conclusion

Campaigns against uranium mining in Australia successfully revalorized uranium, defining it as a hazard rather than as an asset. The result was that for several decades, some of the world's most strategic and accessible deposits of uranium were not mined. The lessons for campaigns to leave fossil fuel in the ground are manifold. First, it is clear that a national-level legislated moratorium can be highly effective even if it allows the expansion of existing mines. Better still, and certainly necessary, would be a legislated phase-out of fossil fuel industries. Second, it is worth emphasizing that the uranium moratorium in Australia arose from a nationally organized anti-uranium campaign that was strongly linked with Indigenous peoples, environmentalists, the labor movement, and key elements in the Labor Party. Third, what linked these groups was a shared rejection of mining and exporting uranium principally due to its cultural, environmental, health, and safety impacts, impacts that were directly felt by local Indigenous peoples and other communities and by workers in the industry. These segments of the population have to varying degrees provided the foundation for a continuing campaign

against uranium in Australia. Fourth, beyond those immediately affected by the industry, the campaigns were able to draw in constituencies concerned about the broader implications of nuclear power, nuclear weaponry, and nuclear waste.

We can find similar themes in the contemporary climate change movement. The movement requires a strategic vision that can engage legislative power to produce structural transformation. Lacking the capacity to start stopping across all fossil fuels and in all contexts, rather than to stop here only to expand elsewhere, is critical. Alliance building in a campaign to halt mining and extracting, rather than simply to mitigate impacts, is also critical: as with uranium, the first problem is how to halt extraction, and this has to be the condition for any alliance building. Indeed, it is clear that case-by-case contestation of exploration and mining, with action enacted on the ground to draw together people most directly affected by the fossil fuel sector, has to be a high priority. Indeed, in many ways, the emergent climate justice movement has shifted away from abstract debates about climate policy to focus more on these material contexts in which fossil fuels are mined and burned.⁶⁹ The corollary of this shift to the material, though, is the requirement to embed such local struggles in the broader questions of climate stability and endless expansion, as it is only in the context of this broader frame that the local issues gain salience and traction. Without the wider context, the movement may become sidetracked into a series of fragmented efforts at self-protection, not-in-my-backyard efforts that miss the wood for the trees.

Finally, it is worth reflecting on the importance of addressing climate change across all energy sources. Nuclear energy has undergone something of a global renaissance as a clean source of energy. Climate change becomes an opportunity for the nuclear industry as coal, oil, and gas-fired electricity are devalorized. The obvious options, renewable energy and reduced use and greater efficiency, are left unexplored. The vested interests that drive the nuclear sector reconfigure our energy future in their interests. Yet the inherent risks associated with uranium continue to haunt the sector. Despite claims to the contrary from industry and government, what is remarkable in recent years in Australia is the story of strengthening public opposition to uranium exports, rising from a low of about 25 percent in 1982 to about 39 percent by 2007.⁷⁰ More recently the so-called nuclear renaissance has been dramatically truncated. Here the combination of public outrage and government-led phase-outs (e.g., in Japan and Germany) have dramatically undermined investor certainty in the sector, forcing a retreat. Again, there are parallels with the fossil

fuel sector, where the rush to gas as a relatively low-emissions fuel has dramatically unraveled in the face of large-scale environmental impacts. While the Fukushima incident reverberated globally, dealing a blow to the nuclear renaissance, abrupt weather events associated with climate change are having a similar impact, allowing fossil fuels to be framed as inherently dirty and dangerous. The revalorization process combines the direct experience of degradation with a broader crisis of confidence in the commodity. The challenge for keeping them in the ground is to secure this revalorization of fossil fuels as a global hazard. The experience of leaving uranium in the ground demonstrates that the end game for coal/oil and gas is feasible as well as necessary. It would be a legacy of the planet's energy and carbon cycle that these substances are left undisturbed.

Notes

1. International Energy Agency, *World Energy Statistics* (Paris: IEA, 2012).
2. *Ibid.*
3. *Ibid.*
4. OECD, *Factbook 2011: Environmental and Social Statistics* (Paris: OECD, 2011).
5. Carlos Sorentino, "Uranium Mining Policy in Australia: One Step Forward and Two Steps Backwards," *Resources Policy* 16, no. 1 (1990): 3–21; Andrew Ferguson and Peter Lam, "U308: Assessing the Wealth Effects of the Three Mines Policy" (Presented at the 32nd Annual Conference of the Accounting and Finance Association of Australia and New Zealand, 2007), <http://www.afaanz.org>.
6. Michael Angwin, "The Policy Challenges for Australia's Uranium Industry" (London: World Nuclear Association, 32nd Annual Symposium, 2007): 30, <http://www.world-nuclear.org>.
7. Brian Martin, "The Australian Anti-Uranium Movement," *Alternatives: Perspectives on Society and the Environment* 10, no. 4 (1982): 26–35.
8. Gavin M. Mudd and Mark Diesendorf, "Sustainability of Uranium Mining and Milling: Towards Quantifying Resources and Eco-Efficiency," *Environmental Science and Technology* 42 (2008): 2624–30.
9. Martin, "The Australian Anti-Uranium Movement."
10. R. A. Panter, "Uranium Policies of the ALP, 1950–1990" (Department of the Parliamentary Library, research service background paper, 1991).
11. Sigrid McCausland, "Leave It in the Ground: The Anti-Uranium Movement in Australia 1975–82" (PhD diss., University of Technology Sydney, 1999).
12. Les Dalton, "The Fox Inquiry: Public Policy Making in Open Forum," *Labour History* 90 (2006): 137–54.

13. James Camilleri, "Nuclear Disarmament, an Emerging Issue in Australian Politics" (Australian Studies Centre, University of London, Working Paper 9, 1986), 40.
14. Les Cupper and June Hearn, "Unions and the Environment: Recent Experience," *Industrial Relations* 20 (1981): 221–31.
15. See Don Chipp, former coalition government minister, cited in Ashley Lavelle, "Conflicts of Loyalty: The Australian Labor Party and Uranium Policy 1976–82," *Labour History* 102 (2012): 177–96.
16. McCausland, "Leave It in the Ground," 402.
17. Sorentino, "Uranium Mining Policy in Australia."
18. Camilleri, "Nuclear Disarmament."
19. Russell Fox, G. Kelleher, and C. Kerr, *Ranger Environmental Inquiry First Report* (Canberra: Commonwealth of Australia, 1976).
20. *Ibid.*, 183.
21. Dalton, "The Fox Inquiry."
22. Lavelle, "Conflicts of Loyalty."
23. Mary Elliott, *Ground for Concern: Australia's Uranium and Human Survival* (London: Penguin and Friends of the Earth Australia, 1977); Denis Hayes, Jim Falk, and Neil Barrett, *Redlight for Yellowcake: The Case against Uranium Mining* (Melbourne: Friends of the Earth Australia, 1977).
24. James Camilleri, "Nuclear Controversy in Australia: The Uranium Campaign," *Bulletin of Atomic Scientists* 35, no. 4 (1979): 40–44.
25. McCausland, "Leave It in the Ground."
26. *Ibid.*
27. Verity Burgmann, *Power and Protest: Movements for Change in Australian Society* (St. Leonards, NSW: Allen and Unwin, 1993).
28. Panter, "Uranium Policies of the ALP"
29. Martin, "The Australian Anti-Uranium Movement"; Camilleri "Nuclear Controversy in Australia."
30. Elliott, *Ground for Concern*, 4.
31. Lavelle, "Conflicts of Loyalty."
32. Jim Falk, *Global Fission: The Battle over Nuclear Power* (Melbourne: Oxford University Press, 1982); Richie Howitt and John Douglas, *Aborigines and Mining Companies in Northern Australia* (Sydney: Hale and Iremonger, 1983).
33. Panter, "Uranium Policies of the ALP"
34. Fred Halliday, *The Making of the Second Cold War* (London: Verso, 1986).
35. McCausland, "Leave It in the Ground."
36. Camilleri, "Nuclear Disarmament," 3.

37. Independent Committee, *Australia and the Nuclear Choice: Report of the Independent Committee of Inquiry into Nuclear Weapons and other Consequences of Australian Uranium Mining* (Sydney: Total Environment Centre, 1984).
38. Bill Hayden, "Uranium, the Joint Facilities, Disarmament and Peace" (Australian Government, Canberra: Publishing Service, 1984), 3.
39. Damian Grenfell, "Environmentalism, State Power and National Interest," in *Protest and Globalisation: Prospects for Transnational Solidarity*, ed. James Goodman (Vancouver: Pluto Press and Fernwood Publishing, 2002).
40. Ferguson and Lam, "U308"
41. Jim Falk, Jim Green, and Gavin Mudd, "Australia, Uranium and Nuclear Power," *International Journal of Environmental Studies* 63 (2006): 845-57.
42. Greg Baker, "Australia's Uranium" (Department of Parliamentary Services, Research Paper 6, 2009).
43. James Goodman, "Leave It in the Ground! Ecosocial Alliances for Sustainability," in *Nature's Revenge: Reclaiming Sustainability in an Age of Corporate Globalism*, ed. Josée Johnston, Mike Gismondi, and James Goodman (Peterborough, ON: Broadview Press, 2006), 155.
44. Guy Pearse, "Land of the Long Black Cloud," *The Monthly* (September 2010), 20-25.
45. Peter Costello, "Resources are the issue," *Australian Financial Review*, November 16, 2006, 62.
46. Commonwealth of Australia, *Australia's Uranium—Greenhouse Friendly Fuel for an Energy Hungry World* (Canberra: House of Representatives Standing Committee on Industry and Resources, 2006), <http://www.aph.gov.au/house/committee/industry/ur/urreport/fullreport.pdf> Mark Diesendorf, *Greenhouse Solutions with Sustainable Energy* (Kensington, NSW: University of New South Wales Press, 2007); Ian Lowe, *Reaction Time: Climate Change and the Nuclear Option* (Melbourne: Black Ink, 2007); Leslie Kemny, "The Right Road to Clean Energy," *Australian Financial Review*, June 27, 2012, 55.
47. Jim Falk and Domenica Settle, "Australia: Approaching an Energy Crossroads," *Energy Policy* 39 (2011): 6804-13.
48. Katherine Murphy and Misha Schubert, "Government rejects nuclear power," *The Age*, 5 April, 2006: 12. The machinery to bypass obligations under the Nuclear Non-Proliferation Treaty to support an arrangement to export uranium to Taiwan had been negotiated in 2001, according to an exchange on National Interest Notes between the United States and Australian governments, <http://www.austlii.edu.au/au/other/dfat/ia/2001/28.html>.
49. The government approved BHP Billiton's 2007 moves to negotiate the export of uranium to China, despite concerns expressed by the Australian Conservation Foundation that China was not meeting its Nuclear Non-Proliferation Treaty obligations. Australian Conservation Foundation, "BHP to Ship Uranium as China Celebrates One Party State" (October 1, 2009).

50. Richard Leaver, "The Economic Potential of Uranium Mining for Australia," in *Australia's Uranium Trade: The Domestic and Foreign Policy Challenges of a Contentious Export*, ed. Michael Clarke, Stephan Frühling, and Andrew O'Neill (Farnham, Surrey: Ashgate, 2011), 87.
51. Marthew Franklin, "Uranium to China within Months," *The Australian*, January 6-7, 2007.
52. Michael Clarke, "The Third Wave of the Uranium Export Debate: Towards the Fracturing of Australia's 'Grand Bargain,'" in *Australia's Uranium Trade: The Domestic and Foreign Policy Challenges of a Contentious Export*, ed. Michael Clarke (Surrey: Ashgate, 2011), 109; Rory Medcalf, "Powering Major Powers: Understanding Australian Uranium Export Decisions on China, Russia and India," in Clarke et al., *Australia's Uranium Trade*, 67; Ben Doherty, "Gillard Ready to Discuss Indian Nuclear Exports Despite Fears over Safety," *Sydney Morning Herald*, October 15, 2012, 6.
53. Clarke, "The Third Wave."
54. Diesendorf, *Greenhouse Solutions*.
55. Greg Sheridan, "Mid-East Uranium Sales on Cards," *The Australian*, August 2, 2012, 8.
56. The expansion plans would make Olympic Dam the world's largest uranium mine, as well as increase copper output almost fourfold to 750,000 tonnes per year and boost gold production eightfold and uranium production almost fivefold.
57. Friends of the Earth Australia, "Submission to Joint Standing Committee on Treaties: Inquiry into Nuclear Non-proliferation and Disarmament" (Melbourne: Friends of the Earth, 2009), <http://www.foe.org.au/anti-nuclear/issues/oz/ufsl>.
58. The Roxby Dam operates under the Roxby Downs Indenture Act (1982), which provides for wide-ranging exemptions from several South Australian laws, including the Aboriginal Heritage Act, the Freedom of Information Act, and the Natural Resources Management Act. The Indenture Act was amended to 2011 to enable the expansion of the mine. Australian Conservation Foundation, *News and Media: "Olympic Dam Economics: Do the Benefits Outweigh the Costs?"* August 6, 2009.
59. For instance, the safety record of the operators of the Honeycomb mine in South Australia, Heathcote Resources, a subsidiary of General Atomics, has been highlighted with reports of a number spills at the General Atomics plant in Oklahoma; Jim Green, "General Atomics, Heathcote and the Beverley Uranium Mine," *Punch*, August 2, 2012, <http://www.foe.org.au/chain-reaction/edition/116/heathgate>.
60. Burgmann, *Power, Profit and Protest*.
61. The Sleepy Lizard Revenge campaign takes its lead from the Arabunna dreamtime story of Kalta, a sleeping lizard that "has in its belly yellow poison ... [and] should never have been woken," <http://www.helencaldicott.com/2012/07/the-lizards-revenge>.

62. WGAR News, "Court Throws Out Olympic Dam Challenge," April 20, 2012, <http://indymedia.org.au/2012/04/22/wgar-news-court-throws-out-olympic-dam-challenge-abc-pm>.
63. Commonwealth of Australia, Completion of Kakadu National Park (Koon-garra Project Area Repeal) Act 2013—C2013A00031 (Canberra: 2012), <http://www.comlaw.gov.au/Details/C2013A00031>.
64. See Beyond Nuclear Initiative, <http://beyondnuclearinitiative.com/tag/muckaty>.
65. See Uranium Free NSW, <http://www.uraniumfreensw.org.au>.
66. Sarah Martin and Michael Owen, "Olympic Dam May Never Proceed," *Weekend Australian*, August 25–26, 2012, 4. However, BHP Billiton has since announced that it intends to experiment with a new processing technique—heap leaching—using chemicals to separate minerals from waste ores. Peter Ker, "BHP in fresh bid to unlock Olympic Dam," *The Sydney Morning Herald* July 28, 2014, 1.
67. Leonore Taylor, "Study Rates Nuclear a Cheap Source of Energy," *Sydney Morning Herald*, August 1, 2012, 5.
68. Mahew Dunckley and Ayesha de Kretser, "BHP Recommits to Olympic Project," *Australian Financial Review*, November 14, 2012, 7; Peter Ker, "BHP Gets Four More Years to Expand Olympic Dam," *Sydney Morning Herald Business Day*, November 14, 2012, 5; Sarah Martin, "Olympic Threat as BHP Puts Brakes On," *Weekend Australian*, July 28–29, 2012, 1, 6.
69. Stuart Rosewarne, James Goodman, and Rebecca Pearse, *Climate Action Upsurge: The Ethnography of the Climate Movement* (London: Routledge, 2013).
70. Clarke, "The Third Wave," 141.

9

The Future Would Have to Give Way to the Past: Germany and the Coal Dilemma

Tom Morton

Germany is in the forefront of Europe's ecological modernization move, the technological transformation of industrial society toward cleaner and greener energy and a sustainable economy. Yet even as it does, plans are underway in the heart of former Communist East Germany, to expand the mining of brown coal, the most polluting and inefficient as well as the cheapest and most available form of coal. Here Tom Morton explores Germany's coal dilemma through the words and struggles of farmers and villagers whose lands and homes are threatened once again by a coal juggernaut, a juggernaut many Germans thought would have been long ago abandoned, the dirty legacy of the Communist era with millions of tons of brown coal safely left in the ground.

The dilemma derives in part from Germany's decision to abandon nuclear power in the wake of the Fukushima nuclear disaster in Japan, itself a step toward leaving uranium in the ground. But that policy, along with a commitment to renewable energy, has put even more pressure on Germany's energy supplies to maintain its status as a leading industrial country. Fearing energy shortages with serious economic consequences, powerful interests are now promoting brown coal as a transition fuel; it is, after all, domestically abundant, cheap, and available, they say. What they do not say, though, is that entire villages will have to give way, along with people's livelihoods. Nearly powerless in the larger scheme of national and international energy politics, these villagers are speaking out, calling not just for compensation but claiming the entire project of burning more coal is not legitimate.

Morton captures in his chapter title these peoples' struggle and, for that matter, Germany's dilemma as it tries to transition out of both nuclear power and fossil fuels. To use coal, the future would have to give way to the past, a notion that suggests that Germany's much-heralded future of a society powered by alternative energy would be giving way to