



Industrial transformations and workforce planning

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Australian
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University

Acknowledgement of Country

We acknowledge and celebrate the First Peoples on whose traditional land we meet and work, and whose cultures are amongst the oldest continuing cultures in human history



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Agenda

01	Intro. Energy as a labour issue	25 mins
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02	Best practice policy	25 mins
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	BREAK	10 mins
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03	Lessons so far	25 mins
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04	Reflections from SE Asia	25 mins
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1. Energy as a labour issue







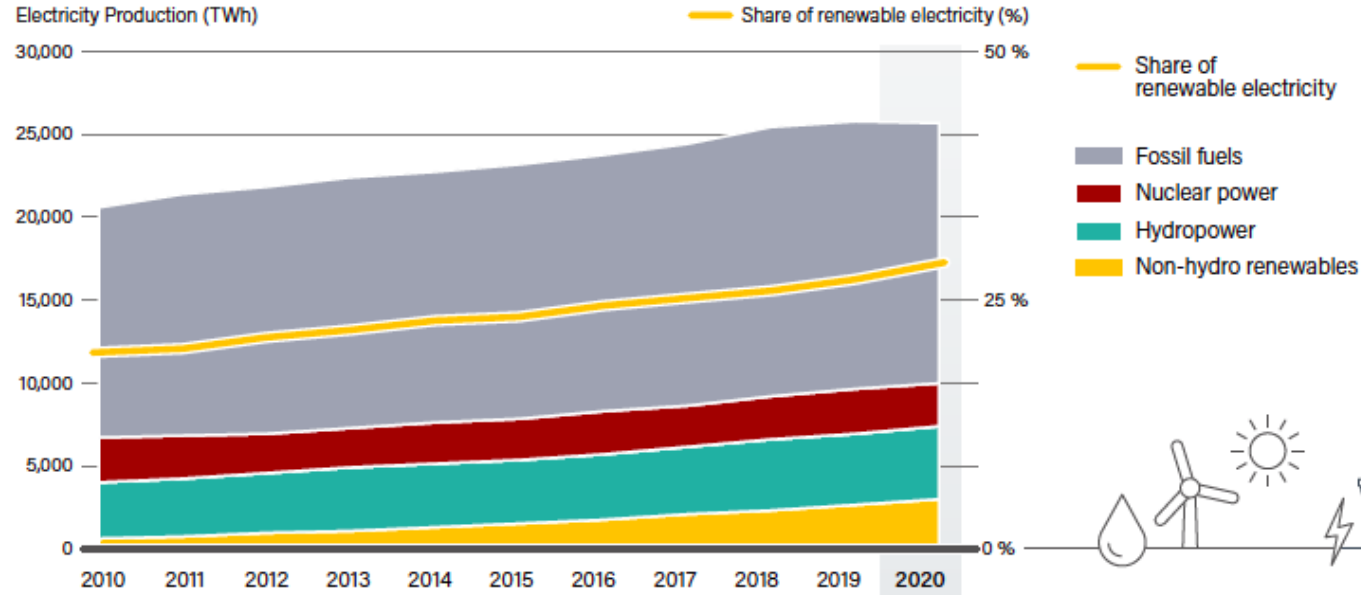


Energy transition as a fuel switch



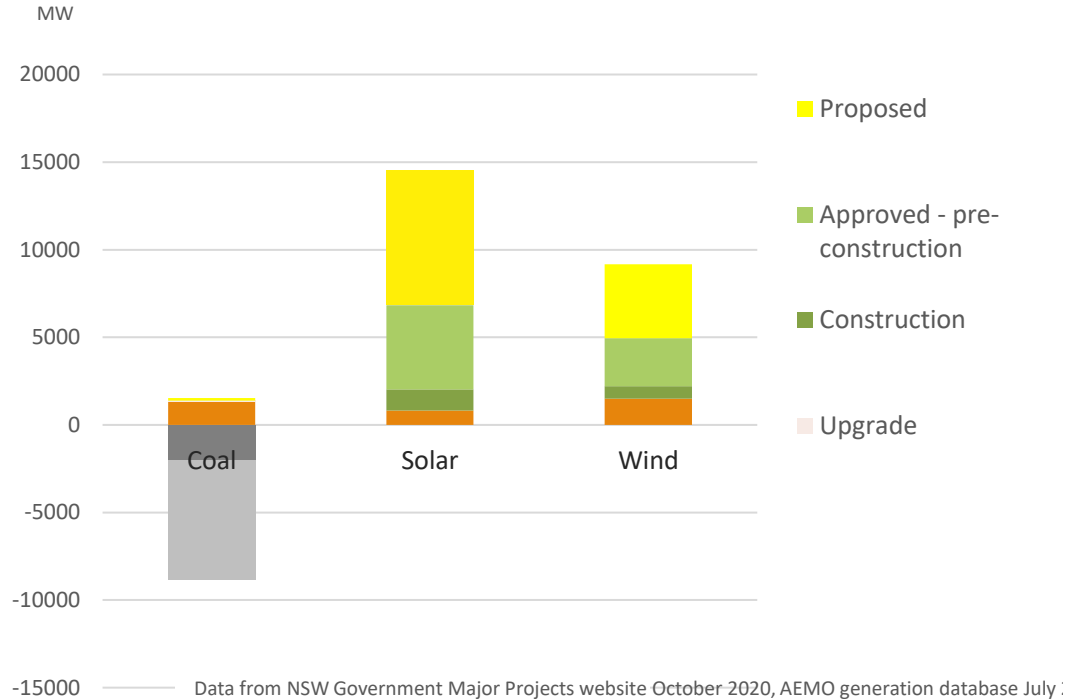
FIGURE 9.

Global Electricity Production by Source, and Share of Renewables, 2010-2020



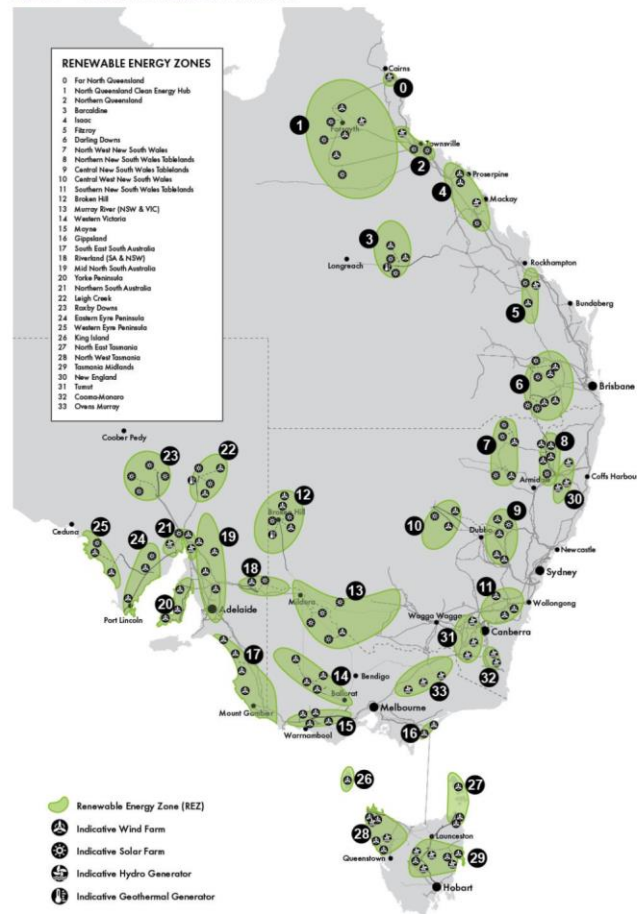
Energy transition as a fuel switch

Capacity of existing and proposed coal, large-scale wind and solar projects in NSW Australia.



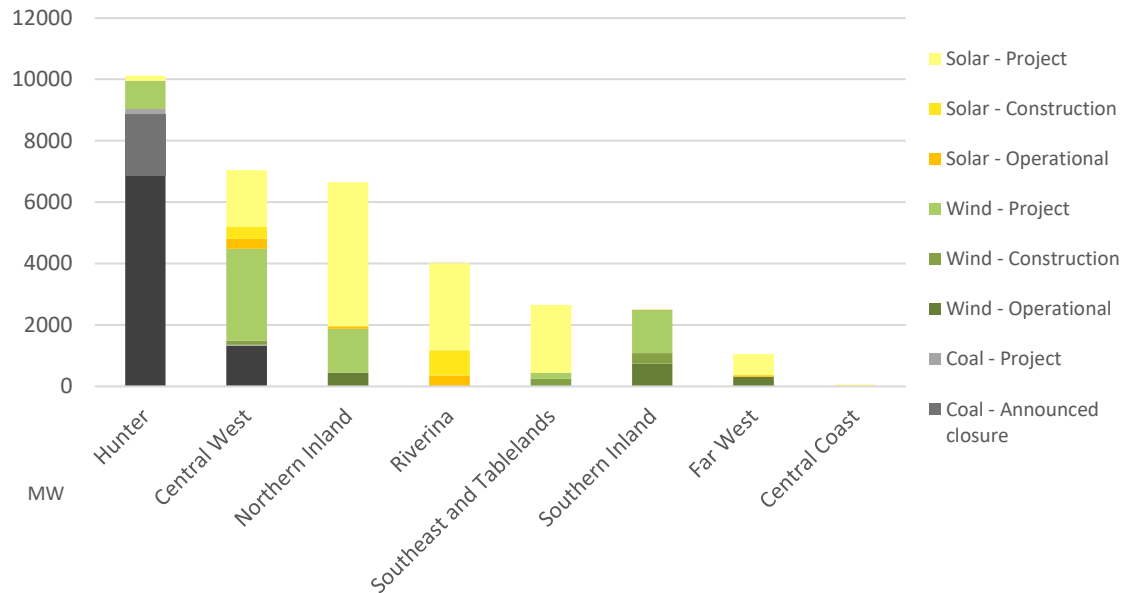
Energy transition as an infrastructure project

Figure 3 Renewable Energy Zone candidates



Energy transition as a spatial shift

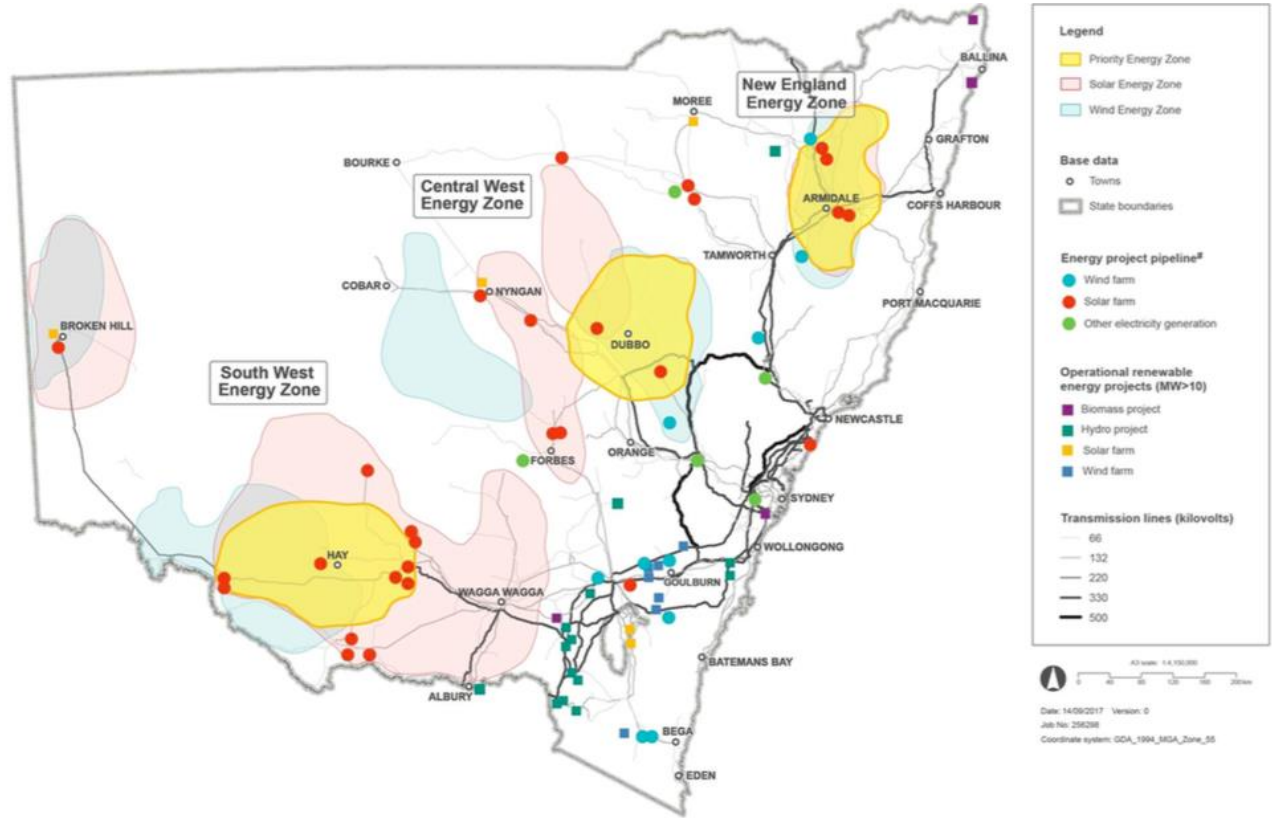
Large scale generation capacity by NSW region (MW): operational, under construction and planned



Data from NSW Government Major Projects website October 2020, AEMO generation database July



Priority Energy Zones (NSW Govt 2018)



* NSW Department of Planning and Environment (2018) Large-Scale Energy Project Pipeline.





Just transition:

What is it? Who needs it?



3. Principles of Energy Justice

Principle	Explanation
1. Availability	People deserve sufficient energy resources of high quality
2. Affordability	All people, including the poor, should pay no more than 10 percent of their income for energy services
3. Due process	Countries should respect due process and human rights in their production and use of energy
4. Good governance	All people should have access to high quality information about energy and the environment and fair, transparent, and accountable forms of energy decision-making
5. Sustainability	Energy resources should not be depleted too quickly
6. Intragenerational equity	All people have a right to fairly access energy services
7. Intergenerational equity	Future generations have a right to enjoy a good life undisturbed by the damage our energy systems inflict on the world today
8. Responsibility	All nations have a responsibility to protect the natural environment and minimize energy-related environmental threats

3. Principles of Energy Justice

Principle	Description
9. Resistance	Energy injustices must be actively, deliberately opposed
10 Intersectionality	Expanding the idea of recognitional justice to encapsulate new and evolving identities in modern societies, as well as acknowledging how the realization of energy justice is linked to other forms of justice e.g. socio-economic, political and environmental

Source: B.K. Sovacool, M. Burke, L. Baker, C.K. Kotikalapudi, H. Wlokas, New frontiers and conceptual frameworks for energy justice, Energy Policy. 105 (2017) 677–691.

<https://doi.org/10.1016/j.enpol.2017.03.005>.

Just transition in a labour perspective

How does work (paid and unpaid) change during energy transitions?

Labour perspectives

Labour as a production cost
(commodity)

Labour as divided
(segmented workforces, households)

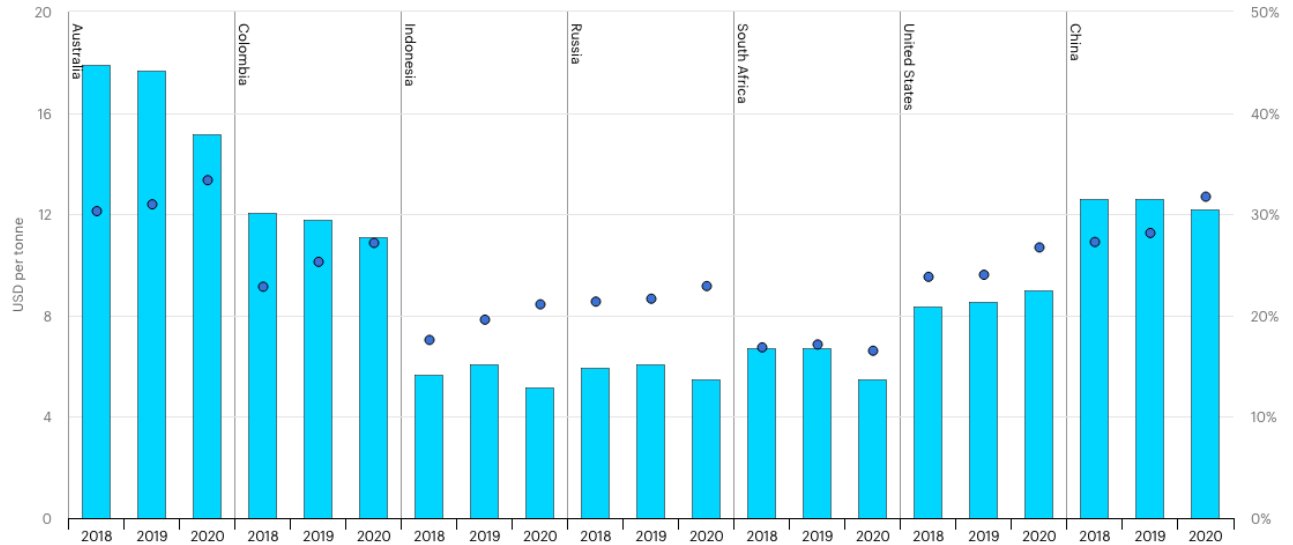
Labour as a subject of regulation
(institution)

Labour as a protagonist
(social agent)



Labour as commodity

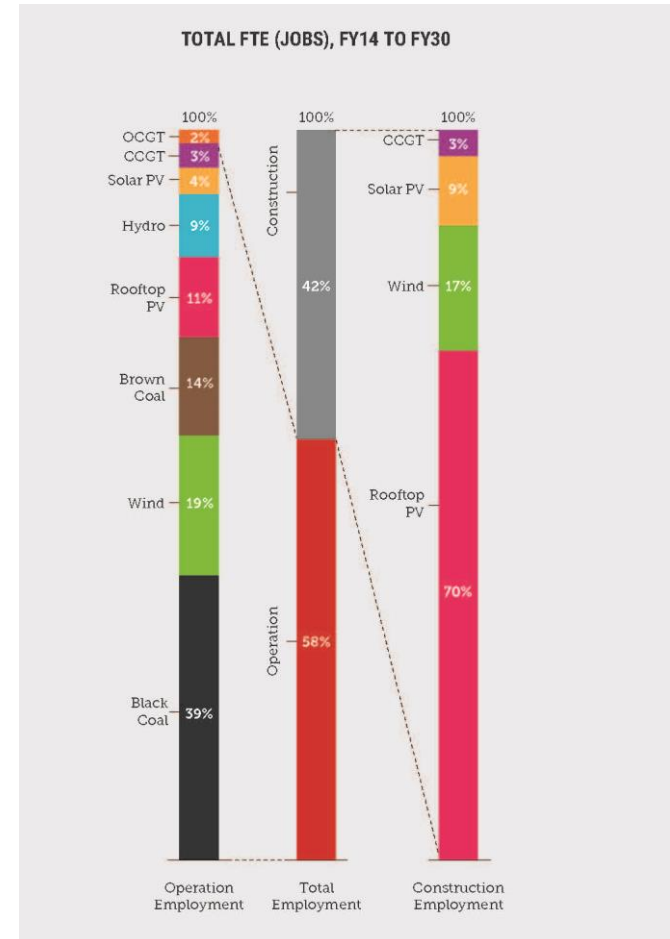
Average labour costs and share in total coal mining costs in selected countries, 2018-2020



Labour institutions



Segmented work



Labour as an interest group



Discussion

Which of these ways of seeing labour make most sense to you?

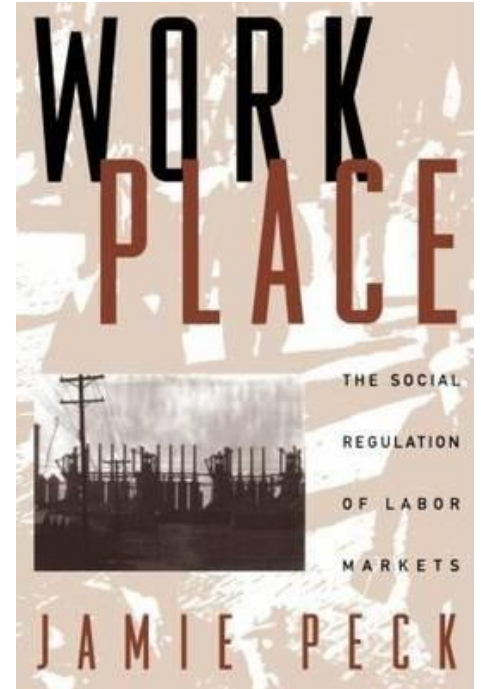
If different stakeholders see labour differently, how can those different perspectives be navigated?

Labour in multiple dimensions

Labour as a peculiar commodity

Labour markets present dilemmas of social regulation

- Incorporating labour
- Allocating labour
- Controlling labour
- Reproducing labour



Current global labour situation (ILO 2022)

Unemployment

- 2022: 207 million
- 2019: 186 million

Pandemic recovery inequalities

- low- and middle-income countries have remained significantly below those observed in richer economies
- efficacy of policy instruments impaired by large informal economies
- growing contingent employment, impairing quality of work conditions
- disproportionate impact on women's LF participation



Labour in Africa (AFDB 2021)

Pre-pandemic:

- widespread informality, working poverty, underemployment and the prevalence of low-productivity work.

COVID impact:

- 1.9 per cent in 2020,
- 30.4 million Africans fell into extreme poverty in 2020; another 38.7 million in 2021.

African Economic Outlook 2021

From Debt Resolution
to Growth: The Road
Ahead for Africa



Fossil fuel workforce transitions: the issues

‘Surprise’ mass redundancies

Older workforce with informal skills

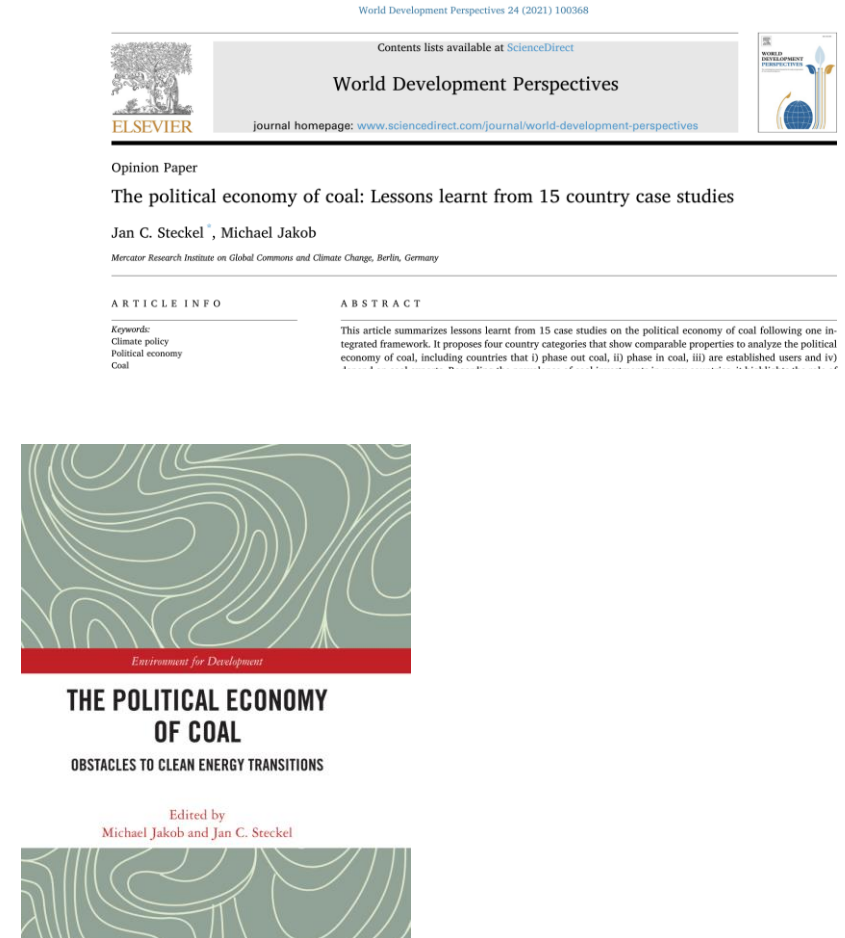
No comparable appropriate employment

Psychological and social effects

Losses spread to regional economy

Vested interests in local job losses. And lobbying.

Social expectations regarding regional development, royalties.





MAY 2017

Just Transition

A Report for the OECD

ITUC Demands for a just transition.

A just transition will:

- * respect the contribution that workers in fossil fuel industries have made to today's prosperity and provide income support, retraining, redeployment and secure pensions for older workers;
- * recognise that investing in community renewal is critical to gain the hope and trust of affected regions and townships whether energy transition, industrial transformation or disaster;
- * support innovation and shared technology to enable energy and manufacturing companies to make the transition with 2020 and 2030 targets for emission reductions and for jobs;
- * involve workers in the sectoral plans for the development of clean mega cities
- * formalise the jobs in rescue, rebuilding and resilience associated with climate disasters;
- * ensure investment in the jobs and decent work vital to both adaptation and mitigation;
- * guarantee essential social protection and human rights ;
- * be backed up by a just transition fund in every nation, and
- * be based on social dialogue with all relevant parties, collective bargaining with workers and their unions and the monitoring of agreements which are public and legally enforceable.



RE workforce transitions: the issues

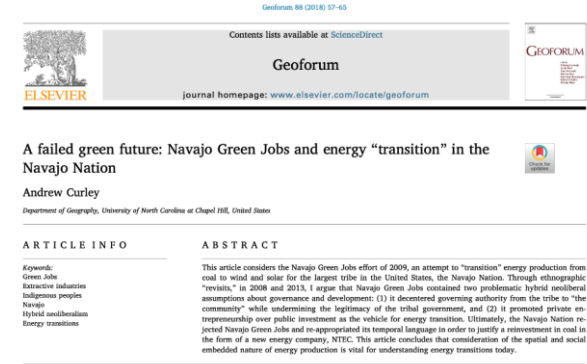
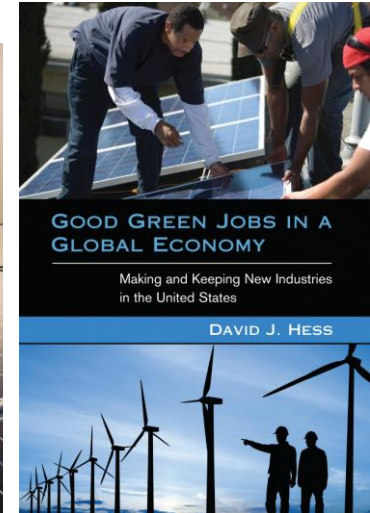
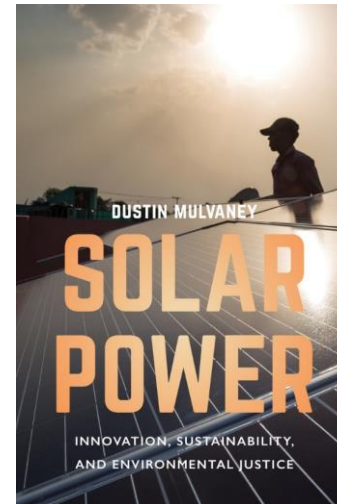
Mining: precarious labour

Manufacturing: hazardous chemical exposure,
poor factory conditions

Installation: migrant, temporary labour

Utilities: public → private sector

Prosumers: households navigating market
regulation



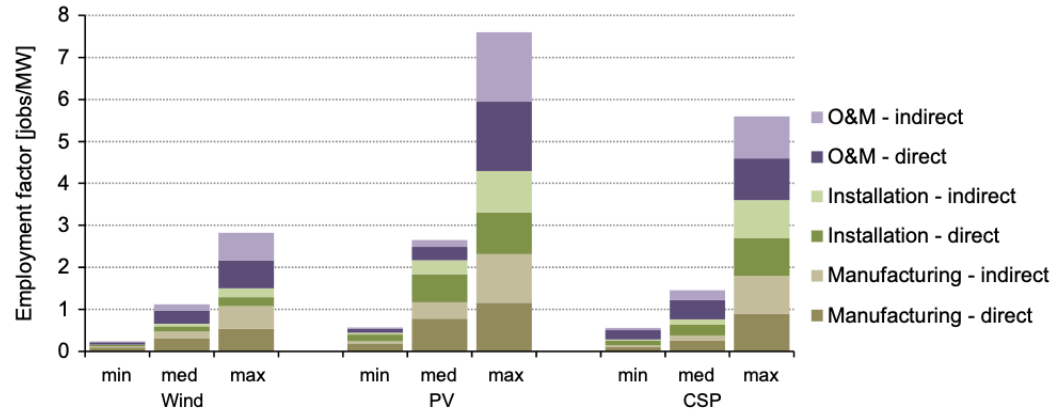


Fig. 3. Direct and indirect jobs per deployment phase (in jobs/MW) for different technologies based on minimum, median and maximum values for employment factors in the available literature.

Cameron, Lachlan & Bob Van Der Zwaan (2015), 'Employment factors for wind and solar energy technologies: A literature review', *Renewable and Sustainable Energy Reviews*, 45: 160-172.



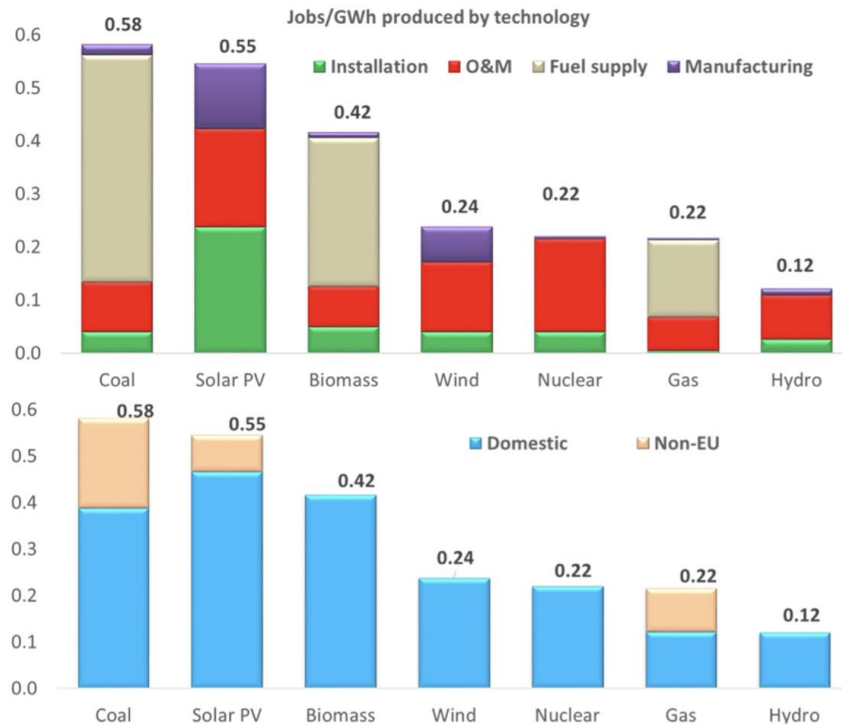
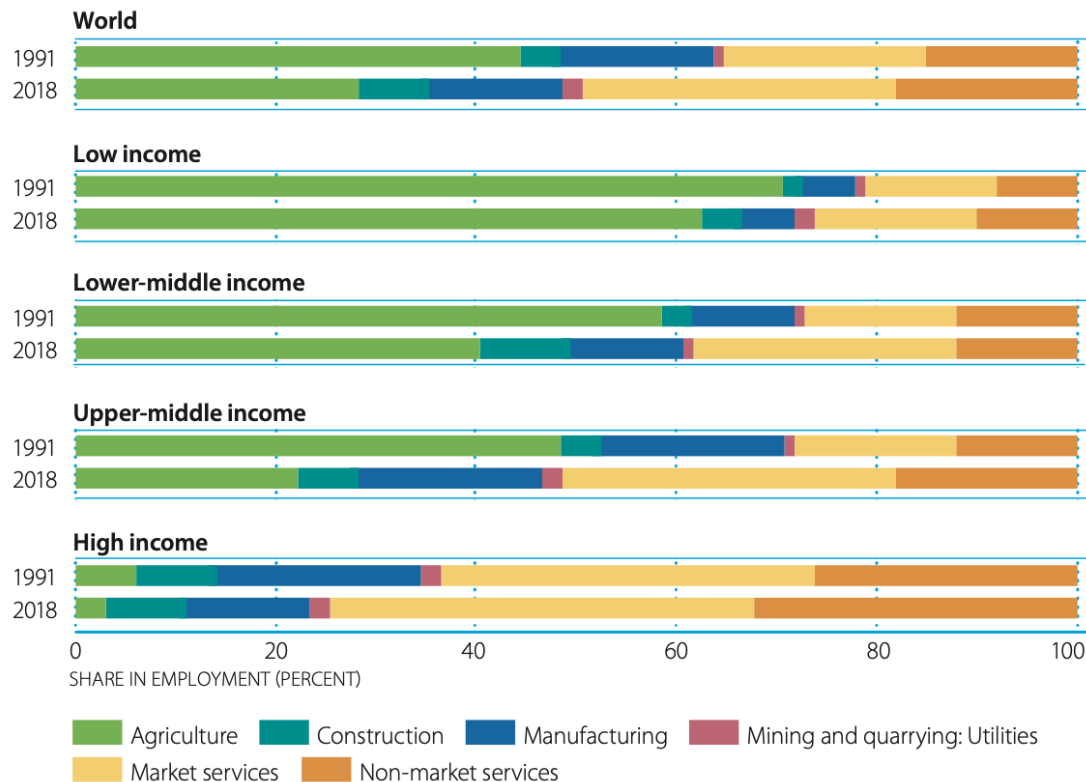


Fig. 1. Employment associated with 1 GWh of annual electricity production by technology in 2015.

Fragkos, Panagiotis & Leonidas Paroussos (2018), 'Employment creation in EU related to renewables expansion', *Applied Energy*, 230: 935-945.

Figure 5.3. Distribution of employment by aggregate sectors, global and country income groupings, 1991 and 2018 (percentages)



Source: ILO (2019)



Gendered energy transitions: the issues

Gendered labour market effects, due to occupational / industrial segregation

Increased LF participation → increased self-esteem, confidence, gaining some financial independence

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Limited access to skills, education

Unequal distribution of household and care responsibilities

Women's low level of control over household income and resources



Article

Strengthening Gender Justice in a Just Transition: A Research Agenda Based on a Systematic Map of Gender in Coal Transitions

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Abstract: For climate change mitigation, a rapid phase-out of fossil fuels such as coal is necessary. This has far-reaching gender-specific consequences. This paper presents a systematic map of the literature that examines the impact of historical coal phase-out processes on women and their role in these processes. The search process consisted of screening over 3100 abstracts and reading 247 full-text studies. The analysis of the 73 publications ultimately included in the systematic map shows that past coal phase-outs meant both opportunities (e.g., increased labour market participation) as well as burdens for women (e.g., double burden of job and household). It becomes clear that agency within coal transitions was also gendered. For example, it was difficult for women to gain access to union structures, which led them to organise themselves into grassroots movements. Our research shows



Citation: Walk, P.; Braunger, I.; Semb, J.; Brodtmann, C.; Qei, P.-Y.; Kemfert, C.

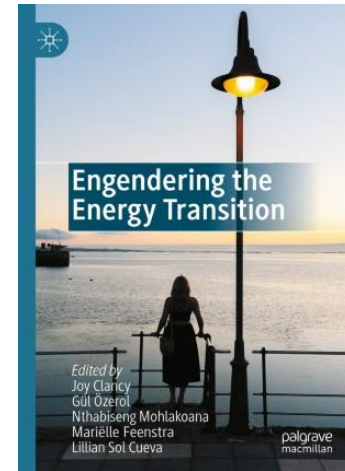
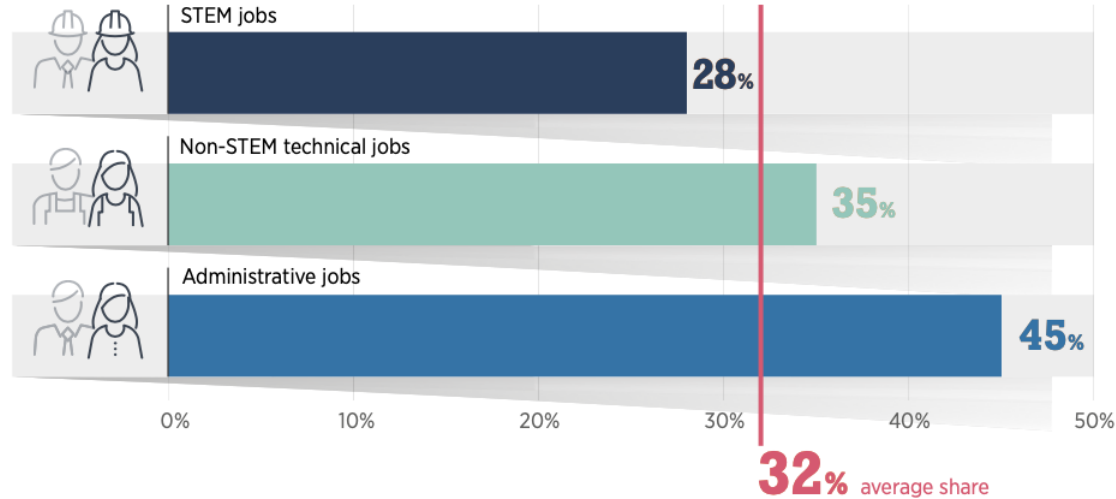


Figure 2.5 Shares of women in STEM, non-STEM and administrative jobs in renewable energy



Source: IRENA online gender survey, 2018.

Notes: STEM = science, technology, engineering and mathematics.

The vertical line indicates the average share of women in renewable energy jobs among survey participants.

RE work in gender perspective

‘The real rural energy crisis is rural women's time, with women working longer work days than men in providing human energy for survival activities such as fuel and water carrying, cooking, food processing, transport, agriculture and small enterprises, non-monetized work which is largely invisible in national energy accounts and labour force statistics’

Oparaocha, Sheila & Soma Dutta (2011), 'Gender and energy for sustainable development', *Current Opinion in Environmental Sustainability*, 3(4): 265-271.



Energy transition and labour

Multiple dimensions:

- Labour markets
- Regional economies
- Total social division of labour (gender)

2. Best practice energy transition policy



Taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities,



PARIS AGREEMENT



UNITED NATIONS
2015





International
Labour
Organization

Guidelines for a just transition towards environmentally sustainable economies and societies for all

IV. Guiding principles

13. The following principles should guide the transition to environmentally sustainable economies and societies:

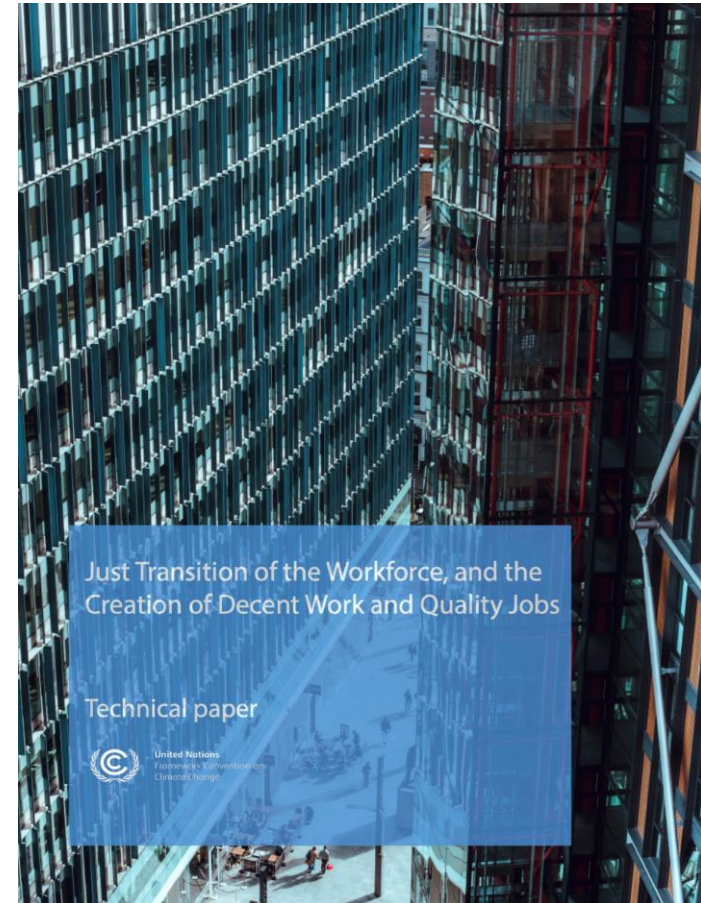
- (a) Strong social consensus on the goal and pathways to sustainability is fundamental. Social dialogue has to be an integral part of the institutional framework for policy-making and implementation at all levels. Adequate, informed and ongoing consultation should take place with all relevant stakeholders.

- (b) Policies must respect, promote and realize fundamental principles and rights at work.
- (c) Policies and programmes need to take into account the strong gender dimension of many environmental challenges and opportunities. Specific gender policies should be considered in order to promote equitable outcomes.
- (d) Coherent policies across the economic, environmental, social, education/training and labour portfolios need to provide an enabling environment for enterprises, workers, investors and consumers to embrace and drive the transition towards environmentally sustainable and inclusive economies and societies.
- (e) These coherent policies also need to provide a just transition framework for all to promote the creation of more decent jobs, including as appropriate: anticipating impacts on employment, adequate and sustainable social protection for job losses and displacement, skills development and social dialogue, including the effective exercise of the right to organize and bargain collectively.
- (f) There is no “one size fits all”. Policies and programmes need to be designed in line with the specific conditions of countries, including their stage of development, economic sectors and types and sizes of enterprises.
- (g) In implementing sustainable development strategies, it is important to foster international cooperation among countries. In this context, we recall the outcome document of the United Nations Conference on Sustainable Development (Rio +20), including section VI on means of implementation.



Broad industrial strategies

1. *just transition of the workforce;*
2. *creation of decent work and quality jobs;*
3. *economic diversification and transformation;*
4. *gender equality.*



1. Closing fossil fuel facilities

Long-term planning

- Consultation
- Independent authority
- Public funds for transition arrangements

Workers

- Skill development, retraining
- Industrial and environmental policies to attract investment to impacted regions

Communities and regional economies

- Economic development opportunities, alternatives



Pre-transition

Establish a timeline for decarbonization using social dialogue

Create plans for new low-carbon industries

During transition

Compensation to workers, retraining and re-employment opportunities

Financial incentives for low carbon industries and support for existing industries to transition to low-carbon alternatives

Investment in community infrastructure



2. Active labour market policies for decent jobs

Productive employment and decent work are key elements to achieving just energy transition

Policies promoting greener products, services and infrastructures → higher demand for labour in green and emerging sectors and activities (solar panel technicians, construction workers, etc.).

Employment services for improving the match between labour demand and supply in new energy sectors

Retraining workers and upgrading skills.



2. Active labour market policies cont.d

Vocational and on-the-job training programmes improve employability of the unemployed + retrenched workers

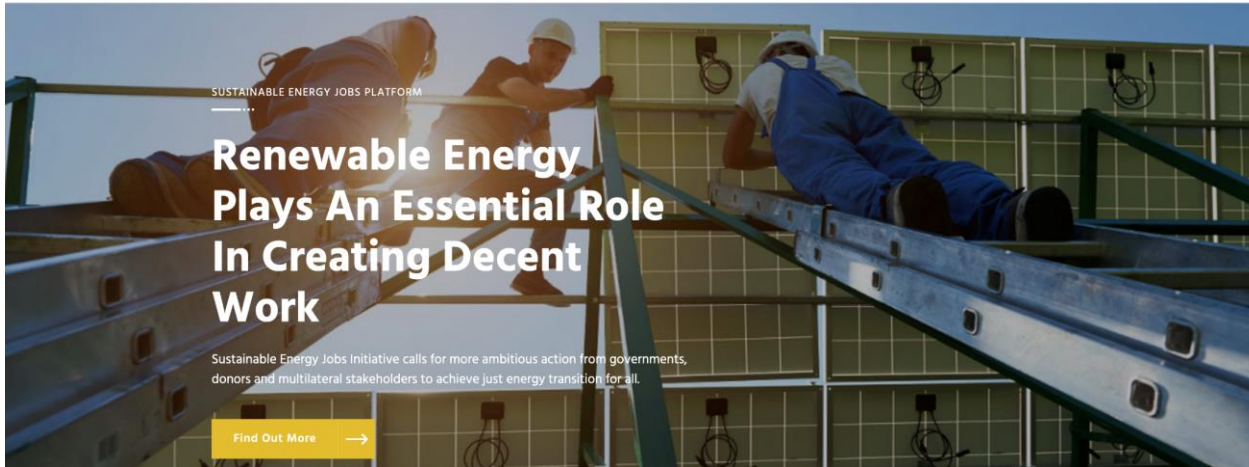
Public employment programmes can help tackle the problem of unemployment and underemployment during transitions while addressing climate adaptation issues

Subsidies can also create green jobs in locations with high levels of unemployment or low levels of economic activity.





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Decent work for sustainable development



3. Economic diversification

Rural RE is not labour-intensive

Focus on rural economies, where agricultural growth can → non-farm work

Strengthening small farms, because they employ the vast majority of the agricultural labour force

Developing food product markets, and reducing risk for producers seeking access to international trade

Territorial policies aiming at strengthening rural-urban linkages through the promotion and development of the service functions of small cities and country towns (not just big cities)





Rethinking the Economic Recovery:

A Global Green New Deal

April 2009

Diversification agendas



4. Gender equality

Build capacity of women to work in the energy sector, and of both women and men to engage with gender issues in energy systems.

Affirmative action initiatives to encourage recruitment of women into RE e.g. gender targets

Retention policies (e.g. childcare), mentorship and training

Flexible work and relaxed mobility requirements

Gender mainstreaming, workplace cultural interventions



4. Gender equality cont.d

Invest in energy infrastructure technologies and end-uses that directly meet poor women's energy demands and reduce their drudgery.

Promote sustainable livelihoods through modern energy services that permit poor women to increase their productivity and income


Increase poor women's choices of cooking fuel.

Promote energy access as a critical intervention for other development sectors

Include and document gender analysis at each step of policy, programme and project planning, implementation, monitoring and evaluation.



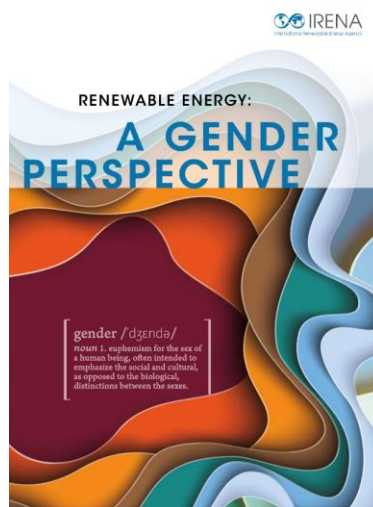
Table 2.3 Selected organisations advocating for gender equity in renewable energy



Name	Year founded	Location of activity	Activities
ENERGIA (International Network on Gender and Sustainable Energy)	1996	22 African and Asian countries	Gender mainstreaming, strengthening women-led energy enterprises, advocacy
WRISE (Women of Renewable Industries and Sustainable Energy)	2005 ^a	United States	Fellowships, awards, webinars, networking, training retreats, in-person and online mentoring
Hypatia	2010	Germany	Networking, events
WISE (Women in Solar Energy)	2011	United States	Education, capacity building, advocacy, strategic partnerships, networking, events
WICS (Women in Cleantech and Sustainability)	2011	United States	Fostering networks of professionals to advance women's role in the green economy (energy and other sectors)
WIRE (Women in Renewable Energy)	2013	Worldwide	Capacity-building field trips, networking, awards recognition programmes, student bursaries, speed mentoring
Women in Sustainability, Environment and Renewable Energy (WiSER)	2015	United Arab Emirates	Advocacy, education and training opportunities for women, platforms for dialogue, showcasing of women's contributions to sustainability
Renewable energy and energy efficiency Women's Network (REDMEREE)	2016	Mexico	Networking, capacity building, training and events
Women in Sustainability (WiS)	2017	India	Advocacy, networking
GWNET (Global Women's Network for the Energy Transition)	2017	Worldwide	Interdisciplinary networking, advocacy, training, coaching and mentoring, and services related to projects and financing
Nordic Energy Equality Network (NEEN)	2017	Nordic and Baltic countries	Bringing together people who are interested in improving gender balance and promoting diversity in energy-related matters

Source: Websites of profiled organisations.

a. WRISE was founded as Women of Wind Energy in 2005; it was rebranded as WRISE in 2017.



Gender mainstreaming initiatives

Institutional conditions for best practice

Social dialogue: Long-term planning and cooperation between stakeholders with potentially conflicting needs and goals (especially business, unions, government and communities).

Broad labour strategies: beyond energy, looking to create diverse economies with greater equality among workers



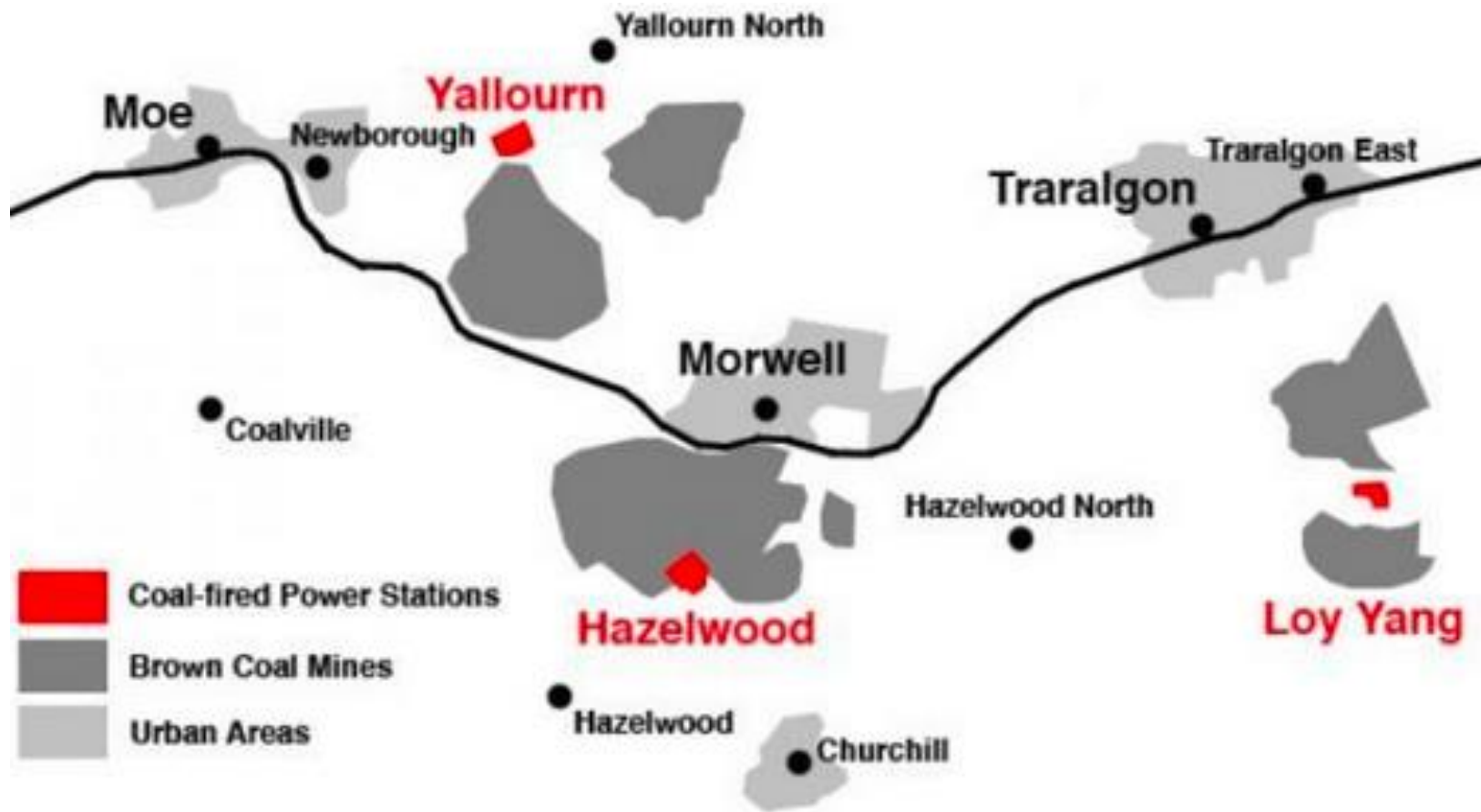
3. Lessons so far



Hazelwood power station, Victoria Closure 2017



Wiseman, John, Stephanie Campbell & Fergus Green (2017), Prospects for a “just transition” away from coal-fired power generation in Australia: Learning from the closure of the Hazelwood Power Station, Canberra: Crawford School, ANU



Box 2: Initial Victorian government Latrobe Valley transition policy initiatives¹⁵

1. **\$22 million in support services for affected workers**, including financial and emotional counselling, education and training programs; support in identifying new business opportunities; the establishment of a Worker Transition Centre (in partnership with the Gippsland Trades and Labour Council) and an expansion of the Back to Work program that assists business in the Valley (Andrews, 2016a).
2. **\$20 million to fund the establishment of a new Latrobe Valley Authority (LVA)** to lead work on economic transition strategies (*Ibid.*)
3. **Establishment of an Economic Growth Zone**, including the local government areas of Latrobe City Council, Baw Baw Shire and Wellington Shire (Andrews, 2016b). This package consisted of two major components — a \$50 million Economic Growth Zone to encourage businesses to re-locate to the Valley via financial incentives such as stamp duty concessions and fee reimbursements to be administered by the LVA, and \$174 million for a Community Infrastructure & Investment Fund to finance local infrastructure projects (Andrews, 2016b; Gordon & Priess, 2016).
4. **Energy efficiency upgrades**: \$5 million has funded energy efficiency upgrades to 1,000 homes of low-income and vulnerable Valley residents (ABC, 2016e).
5. **Morwell Hi-Tech Precinct**: \$17 million was allocated to the development of an innovation precinct in Morwell through collaboration between Federation University, Federation Training, Morwell Tech School, the Victorian Government and Fujitsu (Andrews, 2016c). The precinct is intended to focus on the energy, food and fibre, health and professional services industries, and expected to create 80 jobs in its construction and hundreds of full-time hi-tech jobs in the future (*Ibid.*).
6. **Redundancy scheme**: \$20 million was allocated to a scheme to encourage older workers from the remaining operational power stations to take redundancy packages, thus providing opportunities for younger Hazelwood employees (Anderson, 2017).

¹⁵ This is not a comprehensive list of all programs and projects initiated under the Victorian Government's announcements.



7. **New Energy Jobs & Investment Prospectus:** \$500,000 and 1 full-time-equivalent employee over 2 years to develop tools to encourage investment in small, medium and large scale renewable energy projects — including an investment prospectus for large scale renewable energy projects outlining local workforce, resource and infrastructure availability, and support for local business owners to assess potential savings from solar system installation (Victorian Government, 2017).
8. **Gippsland Line Upgrade:** In addition to the package, a \$345 million upgrade to the Gippsland Rail Line is being undertaken, creating a project office located in the Valley and an expected 400 jobs (Noonan, 2017b).
9. **Worker Transfer Scheme:** A \$20 million Latrobe Valley Worker Transfer Scheme (described in Part 2.4, below) was established via an agreement between labour unions, the Victorian government and electricity generators, announced on the 10th May, 2017.
10. **Public housing upgrade:** \$7.8 million will be invested in the upgrade of 224 public housing properties, creating 80 construction jobs and including the use of more efficient building supplies and utilities to reduce energy bills for tenants and overall environmental impact (LVA, 2017).
11. **GovHub complex:** the construction of a new GovHub office complex in Morwell is scheduled to begin in 2018 and to be completed in 2020, creating 100 jobs (Noonan, 2017a). Once completed, the site is expected to be a base for up to 300 staff, including 150 public sector jobs with positions advertised in the 12 months from the announcement to enable local job-seekers to apply (*Ibid.*) The site will serve as the head office for the Earth Resources Regulation staff responsible for mine rehabilitation and regulation (*Ibid.*)



Regional Communities and Renewable Energy: A Socio-economic Study in New England & Central West NSW

Funding from University of Sydney Research Portfolio

Research team:

Professor Linda Connor (Anthropology, University of Sydney)

Dr Rebecca Pearse (Political Economy, University of Sydney, now ANU)

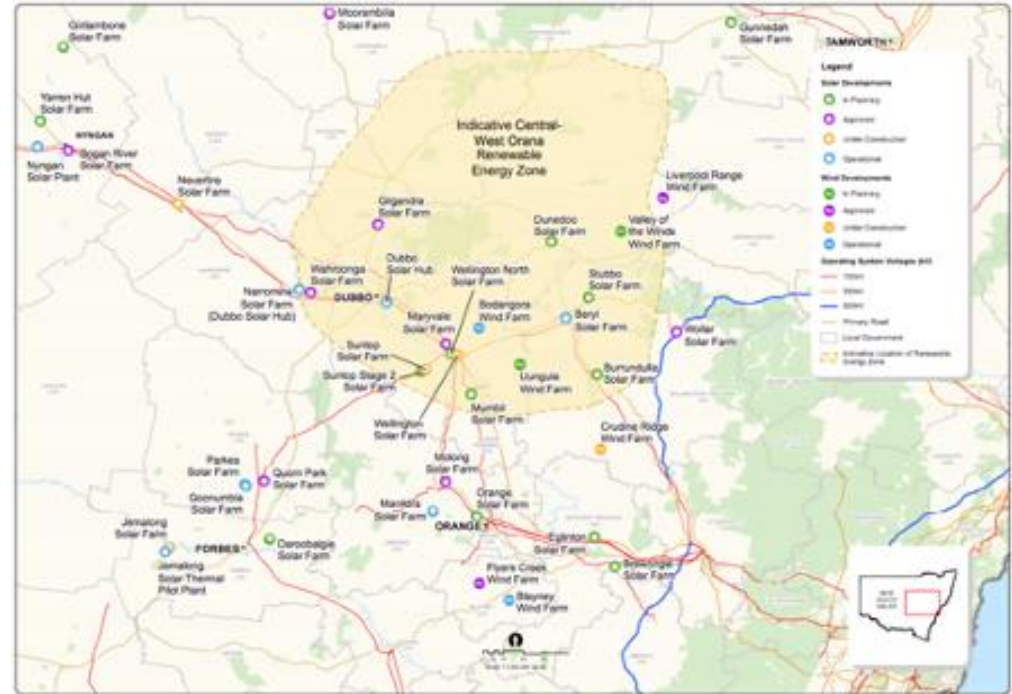
Mr Dan Cass (Strategy, The Australia Institute)

Riikka Heikkinen (PhD candidate, UTS)



NSW Central West REZ

Energy transition regional planning



Renewable energy in Central West NSW



Energy transition regional planning



Renewable energy in New England



Renewable energy in New England



Work in REZ

The RE work boom

T]here are so many incredibly large deliveries passing through town that the state highway patrol has booked four rooms at the Central Motel for the duration of construction, according to hotel manager Wanda Kelly. Next door owner of the Great Central Hotel Tony Hills says the new wave of men in hi-vis has delivered a 10 per cent lift to his business (Brown 2017)

[renewable energy companies] are very keen to keep a good name in the community. The workers would fill their vehicles in town before they left, or they'd get local caterers, or they'd sponsor local activities, that sort of thing.
(Town worker)

Limits on capacity

We encouraged local businesses to go out and gear up to for the new work. Some did, some just didn't have the capacity to work in that larger business field. The local crane hire firm, they've bought additional plant and got a lot of work out of the project. They've continued to expand on the back of it and picked up other larger projects.

(Council officer)



Findings

Uneven development:

The economic benefits and impacts of renewable energy development in the emerging NSW REZs are distributed unevenly among rural community members.

Direct and indirect employment:

The construction phase provides the largest economic benefit to the greatest number of residents, through direct and indirect employment and related commercial activity, especially in the retail, hospitality and accommodation sectors.

Land use contract negotiations:

Individual contractual payments to landholders hosting renewable energy utilities are the largest single source of long-term economic benefit. Neighbours may see themselves as 'losing out'.

Indigenous people:

There must be stronger processes for inclusion of Traditional Owners and other Aboriginal residents in consultation, strong protection of cultural heritage and proactive efforts to maximise benefit sharing.

Regional planning:

The pace and sequencing of renewable energy developments is important for orderly management of community impacts and benefits, from prospecting to construction.



Conclusions

1. Industrial change, and therefore work, is at the centre of the social transition
2. Renewable energy (RE) is a rural and social transition. It emerges within already unequal labour markets.
3. Direct formal RE employment alone is not enough for just sustainable development.
4. Policies for decent green work should be broad.



4. Labour and energy transition across SE Asia



Discussion

Do these patterns of change and the issues documented on labour in energy transition resonate?

What are the unique considerations in your countries of work?