

Energy Transition: A Labour Law Retrospective

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ABSTRACT

This article investigates labour law and industrial relations implications of the energy transition from fossil-fuels to renewable energy sources. It discusses how and why different energy paradigms and their political economies have affected labour and industrial relations institutions over time. It is argued that sustainability of working conditions depends largely on organised labour's access to, and control over, the natural, energy resources on which workers' livelihoods depend. Drawing on a novel literature that considers energy sources as a core analytical referent, the following trajectories are presented and discussed. While the possibility of labour control over the mining and distribution of coal has favoured the development of democratic institutions and welfare state in Western jurisdictions and in recently developed economies in the so-called Global South, 'petro-capitalism' and the political economy of nuclear energy have contributed to the dismantling of internal labour markets and to the crisis of classical labour law and industrial relations institutions. In contrast to oil and nuclear power, renewable energy sources could favour the transition from an extractive economic model to one that is generative and participatory: by democratising the political and economic power of energy, renewables might be able to better serve human welfare, labour and the environment. Technological progress will be a decisive factor in facilitating the democratisation of the energy system. No less important are the institutional, political and legal variables which will be needed in the process of concluding the energy transition and building the society that future generations of workers and citizens deserve.

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1. INTRODUCTION

Faced with the challenges of the energy transition, organised labour is called upon to rethink the meaning of its core nature and purposes. Once the romanticised idea of infinite growth on a finite planet has vanished, the advent of a new era of progress more attuned with the environmental values may involve a revitalisation of labour law and industrial relations institutions or, to the contrary, undermine their existential justifications. While the energy transition from fossil fuels to renewables could merely be an attempt to embellish a contested system, in fact, it would still have significant implications for labour law and industrial relations institutions. This would not only be because of the social and employment effects of decarbonisation policies. The more radical scrutiny of the global ecological crisis—hailing from the critical academic community, from civil society and from student movements—is not understandable except in relation to the deadlock of the socio-economic model that the labour movement has contributed to building and to the juridical-institutional structures that are the symbol of that model. If the Anthropocene is ‘the result of human practices which have their origins in social institutions,’¹ labour law and industrial relations are unavoidably bound to the ecological disorder. It is through work, indeed, that the human species fits into its environment and transforms it, to the point that ‘the preservation—or deterioration—of our ecosystem clearly depends on the organization of work and the choice of its products.’²

Consistent with systemic approaches to the analysis of how institutions evolve, that see legal and economic systems developing in parallel with each other in a mutually constitutive way,³ a labour law retrospective on the shift from fossil fuels to renewables is therefore important for advancing a meaningful legal and industrial relations understanding of

¹S. Deakin, ‘The Law of the Anthropocene’, in S. Besson, S. Jubé (eds.), *Concenter les civilisations: mélanges en l’honneur d’Alain Supiot* (Paris: Seuil, 2020) 113–22, at 113

²A. Supiot, ‘Labour is Not a Commodity: The Content and Meaning of Work in the Twenty-first Century’ (2021) 160 *International Labour Review* 1–20 at 5. See also A. Supiot, ‘Homo faber: continuità e rotture’ in A. Honneth, R. Sennett, A. Supiot, *Perché lavoro? Narrative e diritti per lavoratrici e lavoratori del XXI secolo* (Milan: Fondazione Giangiacomo Feltrinelli, 2020) 21–54 at 51.

³S. Deakin, ‘The Contribution of Labour Law to Economic and Human Development’ in G. Davidov, B. Langille (eds.), *The Idea of Labour Law* (Oxford: OUP, 2011) 156–75 at 162–3. The systemic approach to the analysis of legal and economic systems is further developed in the perspective of the law-technology nexus in S. Deakin, C. Markou, ‘The Law-Technology Cycle and the Future of Work’ (2018) 158 *Giornale di diritto del lavoro e di relazioni industriali* 445–62.

the energy transition. It is also needed to shed light on the root causes of an epochal challenge—global warming and climate change—which, contrary to what a simplistic approach to the issue could lead us to believe, is not a contemporary problem. Today the effects of a systemic crisis are manifesting themselves. But their roots lie in the rise and fall of fossil-fuel capitalism, in the context of which the nexus between the energy model and labour law and industrial relations institutions was socially and legally constructed.

Drawing on a novel literature that sees energy sources as a core analytical referent, this article will discuss, on the one hand, how and why the energy paradigm dominating in different developing stages of industrial capitalism contributes to shape labour law and unions' ways of being. On the other hand, it will examine how and why the effect of energy production on major factors regarding labour and welfare—employment, working conditions, unions power and environmental quality—varies greatly depending on the possibility of socialising the political and economic power of energy sources and natural resources. Although some parts of this article will extensively dwell on past events, this is not going to be a historical work. Following Polanyi, rather than presenting 'a convincing sequence of outstanding events,' the purpose of this article is to unfold 'an explanation of their trend in terms of human institutions.'⁴ In this connection, the following trajectories are identified and discussed in the sections below.

While the possibility of labour control over the mining and distribution of coal has favoured the development of democratic institutions and welfare state in Western jurisdictions and contemporary developing economies, 'petro-capitalism' and the political economy of nuclear power have contributed to the dismantling of internal labour markets and to the crisis of classical labour law and industrial relations institutions. The transition away from these sources of energy, therefore, is not to be seen as a societal goal that has nothing to do with labour law and industrial relations: it is inherently consistent with the interest of workers and organised labour. In contrast to oil and nuclear energy, solar power is presented as a source of energy that could help the transition from an extractive economic model to one that is generative and authentically participatory. By re-socialising the political and economic power of energy, renewables might be able to better serve human welfare, to re-empower workers and unions' capability to advance

⁴K. Polanyi, *The Great Transformation: the Political and Economic Origins of Our Time* (New York: Farrar & Rinehart, 1944) at 4.

sustainable working conditions, and to further deconstruct the conflict between labour and the environment.

However, this transition comes with many contradictions and dilemmas. Instead of being mutually exclusive, and neatly distinguishable along historical lines, the energy and institutional trajectories identified occur and intersect at different times in different jurisdictions, as the contemporary relevance of the mining industry in many parts of the planet shows. Rather than emphasising a discontinuity between different and contrasting patterns in history, therefore, the retrospective analysis provided in this article offers the opportunity to unravel the root causes of classical labour law rationalisation and juridification, whose epistemological status has built its foundation in the social and political achievements of miners' struggles against labour commodification, and those underpinning the process of universalisation of its normative goals,⁵ which could fall under the persuasive but still uncertain theoretical perspectives of capabilities and sustainable development.

2. DEMOCRACY AND TRADE UNIONISM IN THE COAL AGE

It was under industrial capitalism that coal became the main energy source for the socio-economic development of Western countries. Unlike as in previous modes of production and agrarian societies, the energy consumed in the industrial productive process stemmed from the earth itself.⁶ Between the first and second industrial revolutions, large scale textile and steel districts rose up near the coal mines. From England to North America, Germany to France, coal favoured the development of canals to transport it and industrial smelting processes for steelmaking, railways and (later) for electricity generation. In his *The Coal Question*, Jevons observed how coal stood not beside but entirely above all other commodities: 'It is the material energy of the country—the universal aid—the factor in everything we do. With coal almost any feat is possible or easy; without it, we are thrown back into the laborious poverty of early times.'⁷

It was the mine, more so than the factory, that set the stage for industrial society. The mine facilitated a collective imagination pervaded by human

⁵G. Davidov, *A Purposive Approach to Labour Law* (Oxford: OUP, 2016).

⁶E. Altwater, 'Conceptualising Globalisation: Fossil Energy, Global Finance and the Labour Market' (1978) 1 *Work Organisation, Labour & Globalisation* 5–14 at 8.

⁷W.S. Jevons, *The Coal Question: An Inquiry Concerning the Progress of the Nation, and the Probable Exhaustion of Our Coal-mines* (London: Macmillan, 1866) at 2.

suffering and the struggles of workers, contributing to the construction of the identity of labour law and trade unionism in the ninetieth century. The historical importance of the miners' unions in defining the fundamental categories and legal mechanisms of labour law and industrial relations was highlighted by the Webbs in their seminal writings. In the second edition of their *History of Trade Unionism*, the two scholars provide an account of the social construction of minimum standards in early labour law, noting how the Miners' Federation of Great Britain—thanks to the power of control it exercised over coal mining processes—'firmly and insistently put forth the demand that the workers' standard of living should not depend on the fortune or failure of the mine owners in bargaining with big consumers; that, should the business owners want to employ many or few workers, they should receive a salary sufficient to live on (a *Living Wage*); and that this minimum wage was considered, like the rents paid to the owners of the mines, as a fixed onus on the industry'.⁸ Although the miners' union was unable to obtain any immediate agreement to its demands, the result of disputes was to ultimately strengthen the labour movement as a whole, 'in favour of a fixed minimum, below which wages could not fall'.⁹ The coal mine owners did not even attempt to reduce earnings below the *minimum* imposed by their federation, aware that the workers would resist 'with all their might against any attempt in this direction'.¹⁰

The miners' power to generate conflict was enormous.¹¹ And it was far more radical than anything the unions of other industries could manage to mobilise against labour commodification. Indeed, it enabled them to control the 'tap' of the lifeblood of the nascent industrial society: the energy produced by coal. Jevons stated that if the British miners had decided to throw in the towel, they could have 'paralysed the country's industry' and 'compromised livelihoods', thus endangering the 'health of millions of their fellow citizens'.¹² In short, coal had become 'the driving force of all industry

⁸S. Webb, B. Webb, *Storia delle unioni operai in Inghilterra* (Turin: Unione Tipografico-Editrice Torinese, 1913) (first published 1894) at 10. See also S. Webb, *The Story of the Durham Miners (1662–1921)* (London: The Labour publishing company, 1921).

⁹S. Webb (note 8) at 10.

¹⁰*Ibid.*

¹¹R. Challinor, B. Ripley, *The Miners' Association: A Trade Union in the Age of the Chartists* (London: Lawrence and Wishart, 1968) *passim*; R. Church, Q. Outram, *Strikes and Solidarity. Coalfield Conflict in Britain (1889–1966)* (Cambridge: CUP, 1998) 74–85.

¹²W.S. Jevons, 'Lo stato in relazione al lavoro' in C. Arena (Ed.), *Lavoro*, Vol. XI of the *Nuova collana di economisti stranieri e italiani*, edited by G. Bottai, C. Arena (Turin: Unione Tipografico-Editrice Torinese, 1936) at 274.

and its source of livelihood'; to the point that an all-out miners' strike would have thrown the country 'into a complete state of siege, similar to that to which Paris was subjected by the Germanic armies'.¹³

The working conditions faced by coal miners rendered their claims not only just *per se*, but also socially acceptable with respect to the undesirable effects of the strike on social and economic life.¹⁴ Citizens and blue collars from other industries were in solidarity with the miners because they toiled in unsustainable conditions, far worse than those of the workers employed in the textile and steel factories. The description of the Webbs on this point is emblematic: '[The miners] had been barely freed from servitude, since the law completely emancipating them had not been passed until 1799. In the north of England, the *yearly bond*, the *truck* system, and arbitrary fines for job performance below a certain level (*short measure*) kept underground workers in a state of complete subjection. The result of this is demonstrated by the turbulence of their frequent strikes, during which it was often necessary to resort to troops to quell their violence'.¹⁵ In other countries, the miners fared no better.¹⁶

In parallel with the construction of the power and political identity of trade unionism, coal industry disputes against labour commodification contributed to the birth and affirmation of the principles and institutions underlying contemporary Western democracies, expanding the capacity for economic growth of industrialised countries and influencing their institutional structure.¹⁷ While the growth of democracy was associated with the emergence of labour law rules,¹⁸ democratic political structures facilitated the coalitions which pressed for broader societal reforms. Coal miners' collective action was truly political: they were able to organise themselves effectively both underground and in the surface, building 'complex political machines, networked across their coal-based economies'.¹⁹ Through the use of strikes as a weapon, employed in the form of sabotage, slow-downs or the

¹³ *Ibid.*, 274–5.

¹⁴ Challinor (note 11).

¹⁵ Webb (note 8) 91.

¹⁶ S. Serra, *Un'antica civiltà del futuro. Profilo storico del settore minerario sardo nella storia della Sardegna dalle origini ai giorni nostri* (Iglesias: Cooperativa Tipografica Editoriale, 1997) at 70. Cf. Q. Sella, *Sulle condizioni dell'industria mineraria in Sardegna* (Nuoro: Ilisso, 1999) (first published 1871) *passim*.

¹⁷ T. Mitchell, *Carbon Democracy* (London: Verso, 2011) at 26.

¹⁸ S. Deakin (note 3) at 174.

¹⁹ H. Beynon, R. Hudson, *The Shadow of the Mine. Coal and the End of Industrial Britain* (London: Verso, 2021), at 8.

diversion of energy flows,²⁰ coal miners consolidated their ‘marked tendency to increasingly resort to parliamentary action’,²¹ to support broader social and political demands: pensions, healthcare, the right to vote, and so on.

The flow and concentration of energy rendered it possible to align the power of the miners to that of other workers and to strengthen their claims in a way that could no longer be ignored. This was true not only for Great Britain, Western Europe and the United States but also for other countries with major coal deposits, including China,²² in which the first forms of social legislation began to spread in response to the growth of labour disputes in the mining industry.²³ In the areas with a greater coal mining vocation, the early years of the twentieth century saw disputes by mine workers fighting for an improvement to working conditions, with a reduction in shifts to eight hours, the abolition of piecework and the application of collective agreements regarding the tariffs bargained with the union.²⁴ In the name of continuity of production and public order, many such disputes were repressed with violence, resulting in massacres and marking a watershed in the history of the global labour movement.²⁵ In addition to determining the

²⁰In addition to the national coal strikes of 1894, 1912, and 1926 (which exerted a powerful influence over Britain’s political life), Church and Outram reports thousands of small-scale local disputes that occurred in coalfields throughout the United Kingdom at the turn of the 19th and 20th centuries: R. Church, Q. Outram, *Strikes and solidarity*, cit., *passim*.

²¹Webb (note 8) p. 277. Cf. L. Mates, *The Great Labour Unrest: Rank-and-file Movements and Political Change in the Durham Coalfield* (Manchester: Manchester University Press, 2016). Similar developments are reported in relation to the French miners’ federation: P. Louis, *Historie du mouvement syndical en France (1789–1906)* (Paris: Félix Alcan, 1907) at 262.

²²At the beginning of their revolution, Mao and other early leaders of the Chinese Communist Party mobilised an influential labour movement of coal miners in the Anyuan mine and its surrounding area: see E.J. Perry, *Anyuan: Mining China’s Revolutionary Tradition* (Berkeley: University of California Press, 2012).

²³Mitchell (note 17) p. 21–24. For comparative overview of working conditions and regulation of coal mining industry in the first half of the twentieth century, see ILO, *Report of the International Labour Office to the Technical Tripartite Meeting on the Coal Mining Industry* (Geneva: International Labour Office, 1938).

²⁴G.D. Feldman, K. Tenfelde (eds), *Workers, Owners and Politics in Coal Mining. An International Comparison of Industrial Relations* (Oxford: Berg, 1990).

²⁵Unfortunately, the contemporary history of industrial relations is still stained with blood of vulnerable workers fighting against labour commodification in the mining industry. A dramatic example is the Marikana massacre of 16 August 2012, when the South African Police Service killed 34 miners during the repression of a wildcat strike called to improve working conditions at a mine owned by Lonmin in the Marikana area (see discussion in B. Hepple, R. Le Roux and S. Sciarra (eds), *Laws Against Strikes—The South African Experience in an International and Comparative Perspective* (Milano: Franco Angeli, 2016). Despite the tragedy of this event, platinum is the main metal which is mined in the Marikana site: although performing their job in similar, indecent and unsustainable working conditions, workers involved in platinum

rise of labour law as an autonomous field of study and regulation, and the concrete affirmation of the principle that *labour is not a commodity*, such socio-technical aspects provided a fundamental contribution to the definition of the new democratic political regimes that emerged in the first half of the twentieth century.

3. THE RISE AND FALL OF TRADE UNION POWER: FROM COAL TO PETROLEUM

The tie between state sovereignty, economic power and coal was not slackened even within the ‘parentheses’ of the two world wars, which indeed even reinforced such from multiple points of view.²⁶ The main European mines were militarised.²⁷ The arms race that anticipated the two World Wars and the special laws enacted in wartime led to an intensification of extractive activities and mining work. Although this increased the income of mining communities, ‘the organisation of the war economy meant that there was nothing to spend on it’.²⁸ Many miners who had been spared from the battlefields lost their lives in workplace accidents, from technopathies and occupational diseases of various kinds.

With the end of the Second World War and the fall of the totalitarian regimes in Italy and Germany, the miners received symbolic medals of valour from the nascent democratic institutions. On 1 January 1947, the British coal industry was formally nationalised, and coal was championed as a critical asset of post-war reconstruction.²⁹ While the Treaty of Paris of 18th April 1951 established the European Coal and Steel Community (ECSC) as the highest expression of the alliance between market economy and democracy, unions obtained full legal and institutional recognition in all industrialised countries throughout Western Europe and North America. Founded on the trinomial democracy, nation-state and economic growth, the ‘spirit

extracting operations have considerably less political power compared to the 19th century’s coal miners, which *de facto* controlled the energy flux of coal that fuelled the development of the global industrial society.

²⁶K. Gildart, ‘Coal Strikes on the Home Front: Miners’ Militancy and Socialist Politics in the Second World War’ (2009) 2 *Twent. Cent. Brit. Hist.* 121–51; J. Leighton, ‘War and Industry: A Study of the Industrial Relations in the Mining Regions of South Wales and the Ruhr During the Great War, 1914–1918’ (2003) 2 *Lab. Hist. Rev.* 195–215.

²⁷See ILO, *Report of the International Labour Office to the Technical Tripartite Meeting on the Coal Mining Industry*, cit. at 5.

²⁸Beynon (note 19) at 32.

²⁹Beynon (note 19) at 33.

of Philadelphia' allowed the union to be legitimised as a pivotal institution of post-Second World War industrial society.³⁰ Yet, it was a Pyrrhic victory. The close reliance of trade union power on the coal economy and on growth rates so high as to favour the development of standard employment relationships within internal labour markets³¹ significantly reduced the potential for labour mobilisation through classical organisational methods (strikes and collective bargaining), once the use of alternative resources for energy production became increasingly concrete and the number of coal mining jobs rapidly and continuously declined.³²

The shift in employment conditions in coal mining was not only quantitative. Being a miner was much more than being a blue-collar worker; it was a 'way of life', a 'vocation' built around a distinctive code of conduct, which passed from generation to generation, injecting pride and dignity into mining craft and communities.³³ By 1930 'skilled craftsmen with clearly defined and well-understood functions, capable of determining the need for and the performance of a wide variety of tasks, were absent from most mines. The average worker was now a machine tender concerned more with the quantity rather than with the quality of production. This transformation of both workplace and worker left the engineering staff in control of and responsible for the work of the mines'.³⁴ In his *Strikes*, Hyman notes how—starting after the First World War—the progressive introduction of increasingly sophisticated extractive technologies produced a dual effect on the internal labour markets in the mining industry. While it did lead to greater labour sustainability through the elimination of more strenuous tasks and the rise in the added value produced, it also hinted at a more accentuated division of labour and specialisation and professionalisation of responsibilities within the mines, significantly reducing the possibilities of collective coordination, conflict and workers' control of the overall extraction process.³⁵

³⁰ A. Supiot, *The Spirit of Philadelphia: Social Justice vs. the Total Market* (London: Verso, 2012).

³¹ The concept of the internal labor market was intended to emphasise firms and unions as the principal institutions that segment the labor market: P.B. Doeringer, M.J. Piore, *Internal Labor Markets and Manpower Analysis* (London: Routledge, 1985).

³² See B. Galgóczi, 'Phasing Out Coal—a Just Transition Approach' (2019) 4 *ETUI Working Paper* at 11–3.

³³ Beynon (note 19) at 184–6.

³⁴ L. Hovis, J. Mouat, 'Miners, Engineers, and the Transformation of Work in the Western Mining Industry, 1880–1930' (1996) 37 *Technology and Culture* 429–56, at 434. Cf. H. Barger, S.H. Schurr, *The Mining Industries, 1899–1939: A Study of Output, Employment and Productivity* (New York: National Bureau of Economic Research, 1944) at 115.

³⁵ R. Hyman, *Strikes* (London: Fontana, 1971), at 63–64.

This trend was consolidated with the advent of ‘petro-capitalism’. If coal had made industrial development possible in the nineteenth and early-twentieth centuries, the incremental production of energy through other fossil fuels favoured manufacturing growth during the second half of the twentieth century, allowing for the swift rise in new labour-intensive markets where the unions continued to exert power and conflict (consider, in particular, the automotive sector). The new oil and petrochemical industries, nevertheless, radically transformed the nature of post-war capitalism, changing the international division of labour, moving extraction of key resources away from Europe, and marking a qualitative shift in commodity production and consumption.³⁶ In many sectors, such as the textile and fashion industries, labour-intensive naturally occurring goods were replaced by synthetic materials derived from petroleum hydrocarbons that had an average necessary labour content approaching zero. This change produced many advancements in medical and pharmaceutical industries, as well as in the service sector (notable examples are transportation and communication, including the internet). But it also qualitatively increased the scale and scope of low-quality available consumer goods, intensified consumerism and competition in product markets, cheapened the cost of industrial production and enabled huge increases in productivity through labour-saving technologies.³⁷ The advent of vertically disintegrated global supply chains (such as the apparel industry and the correlated ‘fast-fashion’ model) shows how the same shift in production technology, based on synthetic materials produced through petrochemical products, simultaneously resulted in deteriorating employment and environmental conditions.³⁸

Since the 1960s, petroleum has therefore begun to impose the relegation of the social dynamic induced by coal. Almost overnight, the focus of industrial capitalism shifted ‘from mines in the coalfields to tankers in the harbours’.³⁹ As a highly capital-intensive resource, transported around the globe and far from the sites where work takes place, oil has become the energy of globalisation,⁴⁰ making it possible to weaken the human ability to interfere with economic activities and intensifying an invisibility or public unconsciousness of social and environmental externalities of extractive

³⁶Beynon (note 19) at 49.

³⁷A. Hanieh, ‘Petrochemical Empire’ (2021) 130 *New Left Review* 25–51 at 28 and 45.

³⁸B. Commoner, ‘Energy and Labor: Job Implications of Energy Development or Shortage’ (1978) 7 *Alternatives: Perspectives on Society, Technology and Environment* 4–13 at 9.

³⁹Beynon (note 19) at 49.

⁴⁰Altwater (note 6) at 8.

activities.⁴¹ Contrary to what can be found in other industrial value chains, the oil industry has not been subject to stringent anti-monopoly regulations, thus rendering impracticable any attempt at social control by national institutions and workers in regards to a highly-concentrated, global system, that is able to bring into play an economic and political force equal to or greater than that of nation-states.⁴² Without any social and political control of oil's value chain, the redistribution of economic growth stimulated by petroleum and its by-product synthetic goods has been uneven, with severe impact on employment, labour conditions and sustainability of welfare states.⁴³ For many countries and sectors, the escalation of energy prices induced by oil firms caused (and continue to cause) a series of dramatic economic effects—rapid inflation, an erosion of the standard of living of poor families and uncertainties about investments in new production—all of which depressed the economy, worsened unemployment and further disempowered labour.⁴⁴

The energy crises of 1973 and 1979, in particular, accentuated the vulnerability of Western democratic institutions before the geopolitical strength of the countries exporting crude oil, along with the substantial dependence of trade union power on petroleum prices, stressing factors tending to destabilise internal labour markets: globalisation and financialisation of the economy, slowdown in the growth of advanced economies, technical progress and new forms of work organisation, and the weakening of the bargaining position of low-skilled workers. The consequences of the energy crisis were weighty for organised labour. After the mobilisations of 1968, workers fell back on the defensive and 'will never return to the attack'.⁴⁵ The union strongholds of the auto and chemical industries were the sectors in which the oil deadlock had the greatest impact. Basic chemical production, in particular, which used crude oil as a raw material, saw its costs rising to such a level that many plants were put out of business.⁴⁶ Unemployment, deregulation of the labour market and labour disempowerment became part of the same economic trend that generated the energy crisis and the environmental one.

⁴¹ A. Schnaiberg, *The Environment: From Surplus to Scarcity* (Oxford: OUP, 1980) 132–4.

⁴² T.H. Eriksen, *Fuori controllo. Un'antropologia del cambiamento accelerato* (Turin: Einaudi, 2017) at 49.

⁴³ Mitchell (note 17).

⁴⁴ Commoner (note 38) at 6.

⁴⁵ S. Bologna, *Il 'lungo autunno': Le lotte operaie degli anni Settanta* (Milan: Fondazione Giangiacomo Feltrinelli, 2019) at 35.

⁴⁶ *Ibid.*, at 36.

In short, fossil fuels have contributed to creating the possibility of modern democracy but also set its limits.⁴⁷ The liberal political elites were well aware of this. The conversion of the energy system to oil was aimed to ‘permanently weaken the coal miners, whose ability to interrupt the flow of energy had given organized labor the power to demand the improvements to collective life that had democratized Europe.’⁴⁸ Mitchell says that ‘as early as the 1940s, the architects of the Marshall Plan in Washington argued for subsidising the cost of importing oil to western Europe from the Middle East, in order to weaken the coal miners and defeat the left.’⁴⁹

In line with this logic, for example, are the investments in southern England that led to the restructuring, expansion and relaunch of the Esso refinery in Fawley, which became famous during the 1960s for its trade unions having entered into an early form of the productivity agreements which were to go to influence the path of British industrial relations.⁵⁰ Likewise, the European Atomic Energy Community (Euratom) has a close affinity with the US programme to strengthen Western European economic and political resistance to the left, imposing the American capitalist hegemony in the old continent by building and controlling nuclear plants.⁵¹ Also, neo-colonial policies established by the United States, France, Germany and the United Kingdom in the second half of the twentieth century were aimed at expanding geopolitical control over the oil and other critical natural resources, in view of the slow yet progressive disposal of industrial production fuelled by coal. In retrospect, writes Eriksen, it is easy to see that the final act of the old left in Britain was during the extensive miners’ strike of 1984–85, when legendary trade unionist Arthur Scargill lost to Margaret Thatcher’s neoliberalism.⁵² The consequence of such events was truly emblematic for the United Kingdom and beyond.⁵³ Most of the country’s historic mines were decommissioned at the same time as measures were

⁴⁷Mitchell (note 17) 1.

⁴⁸*Ibid.*, at 29.

⁴⁹*Ivi.*, at 236. See also Hanieh (note 37) at 40–1.

⁵⁰A. Flanders, *The Fawley Productivity Agreements: A Case Study of Management and Collective Bargaining* (London: Faber and Faber, 1964).

⁵¹J.E. Helmreich, ‘The United States and the Formation of Euratom’ (1991) 15 *Diplomatic History* 387–410.

⁵²Eriksen (note 42) p. 51.

⁵³For extensive analysis and discussion of the political and industrial relations events that led to the collapse of the British coal industry, and the dramatic implications this involved for the miners, their communities and the entire labour movement, see Beynon (note 19) chapters 4 and 5.

being adopted for the deregulation of labour law and industrial relations legislation.⁵⁴

4. THE PARADOXES OF NUCLEAR POWER

The development of technologies for nuclear energy generation has not much shifted the power balance between capital, labour and the environment. Despite the nuclear industry being characterised by a substantial geographical integration of energy production, the elevated intensity of technological capital, the presence of highly specialised workers, the essentiality of operations' continuity and the resulting impossibility of interrupting the production cycle for security reasons have all resulted in attempts to socialise economic power through collective action being scarcely practicable. And in many cases, public intervention by the state and international institutions has ended up weakening rather than broadening the possibilities of democratising nuclear energy production with respect to both communities and the organisation of labour.

Reflecting on the labour law implications of high-risk technologies, Simitis observed that public regulation to restrict the danger of new substances and energy sources, to reduce, for instance, effects on the environment, inevitably affects the production process.⁵⁵ Yet 'once the production process becomes the target of regulatory intervention, the conditions of work are implicated no less than any other production factor'.⁵⁶ Most importantly, 'where dangers emerge, employment is determined more and more by regulatory interferences based on the requirements of risk-free production'.⁵⁷ The consequences are particularly evident in the nuclear industry and underline 'the paradoxical industrial strength of nuclear workers'.⁵⁸ On the one hand, the substantive bargaining power of nuclear workers is potentially greater than any other group, including the miners; on the other hand, their formal collective rights are 'severely limited, partly by the possibility of criminal sanctions and the use of troops, but especially by the overriding needs of

⁵⁴W. Brown, S. Deakin, P. Ryan, 'The Effects of British Industrial Relations Legislation 1979–97' (1997) 161 *National Institute Economic Review* 69–83.

⁵⁵S. Simitis, 'Juridification of Labor Relations', in G. Teubner (ed), *Juridification of Social Spheres* (Berlin: Walter de Gruyter, 1987) 113–61, at 147.

⁵⁶*Ibid.*

⁵⁷*Ibid.*

⁵⁸R. Lewis, 'Nuclear Power and Employment Rights' (1978) 7 *ILJ* 1–15 at 14.

national security.’⁵⁹ In this industry, detailed statutory regulation applies, penetrating all collective bargaining domains and deliberately imposing on employers and employees a mandatory scheme of behaviour that excludes negotiations and thus all chances of influencing work conditions.⁶⁰ In the US, for example, nuclear industrial technology emerged as a wartime crash programme completely dominated by national defence and security considerations which led the Federal Government to request the unions to refrain from organising activity and introducing collective bargaining procedures.⁶¹

As revealed by reliability tests, political screening and exhaustive controls, nuclear workers are subjected to procedures that restrict their freedom of action and interfere with their personal life to an extent unknown or even inadmissible in other branches of industry.⁶² It is not just that security procedures of this kind might infringe workers’ dignity and freedom: since they are not ‘subject to any meaningful democratic political control’, they are also open to ‘political interference and manipulation.’⁶³ The Chernobyl nuclear disaster (26th April 1986) is one example of this. A design flaw in the plant led to an explosion and radioactive cloud, following a quarrel between engineers and the manager in charge of the control room regarding the activation of safety tests. The Deputy Chief Engineer in charge of the control room deliberately ignored the safety protocols—despite opposition from the technicians coordinated by him, there was no superior or equal who could prevent the test being conducted in line with his directives. Following the refusal of some workers to comply, the Deputy Chief Engineer threatened their dismissal for insubordination, temporarily relieving them of their position and replacing them with workers who were more compliant due to being contractually more vulnerable. Amongst the reasons for the obstinacy of the Deputy Chief Engineer was the prospect of a promotion and a production bonus should the test have a positive outcome, solicited by the Soviet atomic energy authority to determine the strength of the plant in the event of an enemy attack.⁶⁴

⁵⁹ *Ibid.*

⁶⁰ Simitis (note 55) at 147.

⁶¹ J.I. Saks, ‘Labor Implications of Peaceful Uses of Atomic Energy’ (1957) 80 *Monthly Labor Review* 921–31, at 929.

⁶² Simitis (note 55) at 147.

⁶³ Lewis (note 58) at 15.

⁶⁴ M. Catino, *Da Chernobyl a Linate. Incidenti tecnologici o errori organizzativi?* (Milan: Mondadori, 2006).

In short, nuclear is a top-down energy source that generates vulnerability. And this has consequences beyond the problematic implications for employment and industrial relations in nuclear plants. Decisions about where uranium is mined and where nuclear waste is stored are made without any democratic participation, following the same extractive logic of fossil fuels that considers natural resources, workers and communities freely exploitable. Unlike fossil fuels, nuclear is also a cultural issue, especially in countries like Germany,⁶⁵ where the debate around this energy source has been extensively socialised and politicised within the labour movement.⁶⁶ Paradoxically, however, the safety problem has always dominated policy language and anti-nuclear discourses,⁶⁷ fuelling a lack of public consciousness of the real socio-ecological effects of the nuclear value chain: even if nuclear energy has created many decent and comparatively greener occupations in advanced economies, its operations entail exploitation of ecologies and vulnerable populations in underdeveloped countries, where jobs are neither unionised nor well-paid, and where workers and communities undergo the dangers of mining uranium and of nuclear waste.⁶⁸

Contrary to the myth of the energy independence of France, the world's leading country in producing and exporting nuclear power, Granvaud's *Areva en Afrique* dramatically reveals the reality of French extractive operations in the Sahel region.⁶⁹ This book sheds light on the disaster generated in terms of occupational diseases and injuries, destruction of fauna and flora, and radioactive contamination of water and air. Multinational corporations involved in uranium mining deploy intensive public relations strategies and Corporate Social Responsibility programmes to downplay the shattering consequences of their operations for human health and

⁶⁵C. Morris, A. Jungjohann, 'From Meitner to Merkel: A History of German Nuclear Power', in C. Morris, A. Jungjohann (eds) *Energy Democracy. Germany's Energiewende to Renewables* (London: Palgrave Macmillan, 2016) 299–339.

⁶⁶D. Jahn, 'Two Logics of Collective Action' and Trade Union Democracy: Organizational Democracy and "New" Politics in German and Swedish Unions' (1988) 9 *Economic and Industrial Democracy* 319–43.

⁶⁷See for example the French debate and the ambivalent position of unions about nuclear energy: M. Chambru, 'L'évolution des dissonances du syndicalisme français aux prises avec l'énergie électronucléaire et sa critique sociale' (2014) 80 *Mouvements* 67–77.

⁶⁸M. McDonald, 'Is Nuclear Power Our Best Bet Against Climate Change?' (2021) *Boston Review*

⁶⁹R. Granvaud, *Areva en Afrique: Une face cachée du nucléaire français* (Marseille: Agone, 2012). Cf. G. Martin, 'Uranium: A Case-Study in Franco-African Relations' (1989) 27 *The Journal of Modern African Studies* 625–40; G. Martin, 'The Historical, Economic and Political Bases on France's African Policy' (1985) 23 *Journal of Modern African Studies* 189–208.

the environment. They claim to comply with national legislation. Niger's mining code of 2006, for example, requires mining companies to comply with a number of labour and environmental standards, including, but not limited to, prevention and compensation of industrial accidents and occupational diseases,⁷⁰ prevention of environmental pollution, treatment of waste, and preservation of forest and water resources.⁷¹ In the absence of enforcement by public authorities, however, these standards can simply be ignored or greenwashed by multinationals.⁷² Consider the case of Areva (now Orano), the state-owned nuclear power company of France in charge of managing uranium extractive activities in Niger. The company adopted measures regarding the security of the local miners, including 'health observatories' to enable individual compensation for occupational diseases; at the same time, workers had to prove that their illnesses had a causal link to their work in the mines. In more than forty years of operation in Niger, Areva has never recognised the presence of any occupational diseases. NGOs that are part of the observatories denounce the lack of independence of these bodies, blaming Areva's stranglehold on local health facilities, which enabled a 'conspiracy of silence' on the occupational diseases linked to uranium mining.⁷³

The long wave of French colonialism in Africa is currently undermined by new global competitors—notably China, India and Russia—as well as local rebel groups demanding for an equal share of profits from mining uranium.⁷⁴ Instead of using the geopolitical power of uranium to emancipate themselves from domination, though, the increased competition between local groups, including those affiliated to Al Qaeda,⁷⁵ is contributing to disestablishment of the area, making it even more vulnerable to socio-ecological exploitation (of labour), destruction (of nature) and colonisation (of land).

⁷⁰ Article 19, § 1 (f) of Law No 2006-26 of 9 August 2006, modifying Ordinance No 93-16 of 2 March 1993 on the Mining Law of the Republic of Niger, supplemented by Ordinance No 99-48 of 5 November 1999.

⁷¹ Art. 99, § 2, of the Mining Law of the Republic of Niger.

⁷² Y.H. Daouda, 'CSR and Sustainable Development: Multinationals are They Socially Responsible in Sub-Saharan Africa? The case of Areva in Niger' (2014) 28 *Cadernos de Estudos Africanos* 141–62.

⁷³ Granvaud (note 69).

⁷⁴ J. Keenan, 'Uranium Goes Critical in Niger: Tuareg Rebellions Threaten Sahelian Conflagration' (2008) 35 *Review of African Political Economy* 449–66.

⁷⁵ C. Jourde, 'How Islam Intersects Ethnicity and Social Status in the Sahel' (2017) 35 *Journal of Contemporary African Studies* 432–50.

5. METAMORPHOSIS: FROM FOSSIL FUELS TO THE SUN

In parallel with the decline of the coal empire, the history of modern environmental law began, just as the golden age of classical labour law was running out of steam, stimulating a reorientation of the discipline towards the labour market as a focus of study.⁷⁶ If the trade union had been the leading driver of Polanyi's double movement during the nineteenth and early-twentieth centuries,⁷⁷ legislation aimed at protecting the environment would become the main constraint (or legitimation, depending on the points of view) on growth in the last thirty years of the twentieth century, triggering substitutive effects with respect to the safeguarding of the incomes and jobs of workers employed in industrialised countries and giving further impetus to the outsourcing the social and environmental costs of Western capitalism to the Global South.⁷⁸ In this context, at least initially, governments and the trade unions adopted a protectionist approach towards industrial cycles and labour markets heavily reliant upon fossil fuels, to the point of rendering their stance hardly reconcilable with the emerging demands of civil society and environmental movements.⁷⁹

Starting from the 1980s, social democratic programmes embraced the normative goal of sustainable development. This was a moderate version of environmentalism, without any idealised claim to radical transformation of ways of life,⁸⁰ but nevertheless the protection of the environment entered into the industrial relations agenda as a theme that stood alongside and integrated the 'projects of well-being civilisation'.⁸¹ Faced with the failure of

⁷⁶According to S. Deakin, F. Wilkinson, *The Law of the Labour Market* (Oxford: OUP, 2005) at 2, this reorientation of labour law has been occurring since the early 1980s, 'as a response to the relative decline in the importance of collective bargaining as a mode of regulation' and to the parallel rise of individual employment law and active labour market policies.

⁷⁷Polanyi (note 4). For discussion about Polanyi's theoretical framework applied to the three-fold concept of sustainability, see T. Novitz, 'Past and Future Work at the International Labour Organization: Labour as a Fictitious Commodity, Countermovement and Sustainability' (2020) 17 *International Organizations Law Review* 10–40. On the relationships between labour and the environment as fictitious commodities, see also Deakin, 'The Law of the Anthropocene' (note 1) at 116–7.

⁷⁸J. Hickela et al., 'Imperialist Appropriation in the World Economy: Drain from the Global South through Unequal Exchange, 1990–2015' (2022) 73 *Global Environmental Change* 1–13.

⁷⁹This is the argument behind the so-called *Treadmill of Production* theory developed by A. Schnaiberg (note 41).

⁸⁰For a taxonomy about unions positions on environmental problems, see P. Hampton, *Workers and Trade Unions for Climate Solidarity* (London: Routledge, 2015).

⁸¹G. Giugni, *Socialismo: l'eredità difficile* (Bologna: Il Mulino, 1996) at 25.

first-generation energy and environmental policies, witnessed by the rapid increase in energy consumption over the last twenty years and the consequent worsening of the global climate crisis, the phasing-out of fossil-fuels in favour of renewable sources has become a mandatory pathway not only to counter the social and environmental repercussions that energy sustainability involves, but also to allow the maintenance of economic conditions (growth rates and energy prices) compatible with the basic goals of human progress.

Unsurprisingly, the collapse of many civilisations has often depended on human inability to adapt the organisation of work to the constraints of the natural environment.⁸² Carver argued that the story of the human struggle for adaptation takes the form of a joint effort to increase the supply of those goods that nature has provided to an inadequate extent: ‘this is what is meant by industrial civilisation’.⁸³ Translated into the perspective of global energy policies, it would be impossible to imagine that billions of people would continue to consume coal, oil and natural gas with the same consumption standards currently practised in Western economies and in recently developing countries, notably China and India. In view of the exponential rise in the global population, the energy production model based on fossil fuels is doomed to breakdown, compromising energy security of oil importing countries and, as recent disputes in Eastern Europe, South America, Africa and the Middle East have demonstrated, triggering geopolitical, demographic and environmental crises fated to change the destiny of human history forever.

Understandably, the goal of decarbonisation of industrial capitalism is now a *fait accompli* in global energy policy setting. Although the transition away from fossil-fuels might be more incremental than discontinuous, with natural gas (and nuclear power, for France) playing a critical role in phasing-out conventional energy sources, the global energy scenario pushes towards the production of energy from the sun and its derivatives (e.g., wind or biomasses, which indirectly flow from solar energy power). Solar energy is nowadays accepted as the most realistic alternative to fossil-fuels, on the grounds that it is able to stabilise the price of energy, slow inflation, better meet the needs of labour and contribute to contrast the global ecological crisis. Unlike fossil fuels, solar energy is renewable and is not subject to diminishing returns—which means that its price, instead of escalating like

⁸²A. Supiot, *La sovranità del limite* (Milan: Mimesis, 2020) at 136.

⁸³T.N. Carver, ‘La distribuzione della ricchezza’, in Arena (ed.) (note 12) at 61.

the price of conventional energy sources, should be stable and even fall as the cost of devices declines. Whilst these conditions could produce a twofold positive impact on employment—reducing the threat of inflation and easing the task of planning investments in new sustainable enterprises and jobs⁸⁴—they also trigger indirect consequences for labour market regulation, especially in the transition phase to renewable energy sources.

6. THE JUST TRANSITION ERA

International organisations, governments and trade unions in many countries are beginning to seize the compelling necessity of the energy transition.⁸⁵ Arguably, they have gradually come to acquire awareness that any normative proposal to solve just one of the contemporary societal and economic problems—the energy, the environmental and the labour ones—is expected to question the importance of solving the others.⁸⁶ Despite labour standards having ‘distinctive merit as a facet of social sustainability’, they interact ‘dynamically with the realization of environmental and economic objectives.’⁸⁷ And the reverse is also true: the only sound energy and environmental policy—a policy that can best give a stable energy supply and a clean environment—is one that serves the needs of current and future generations of workers.⁸⁸ Simply decarbonising industrial capitalism is not, in short, energy justice.⁸⁹

Since the beginning of the 2000s, the ambition to create so-called ‘green jobs’ has begun to take hold in industrial relations policies at both international and national levels, along with the need to rethink labour protection techniques no longer in terms of the defensive logic typical of internal labour markets but in a way to promote a collaborative contribution to the construction, organisation and development of sustainable labour

⁸⁴ Commoner (note 38) at 9.

⁸⁵ B. Galgóczi, ‘Two Faces of (a) Just Transition: the Coal Story and the Car Story’, in B. Galgóczi (eds), *Towards a Just Transition: Coal, Cars and the World of Work* (Brussels: ETUI, 2019) at 6.

⁸⁶ This is evidenced, for example, by the Agenda 2030 adopted by the UN General Assembly in 2015.

⁸⁷ T. Novitz, ‘Engagement with Sustainability at the International Labour Organization and Wider Implications for Collective Worker Voice’ (2020) 159 *International Labour Review* 463–82, at 465.

⁸⁸ B. Commoner (note 38) at 5.

⁸⁹ N. Barry, J. Healy, ‘Politicizing Energy Justice and Energy System Transitions: Fossil Fuel Divestment and a “Just Transition”’ (2017) 108 *Energy Policy* 451–9, at 457.

markets.⁹⁰ The goal of ‘greening’ jobs and skills has become a vision capable of encompassing a normative instance of progress together with a possible path of emancipation for the labour movement: emancipation from a collective image linked to industrial production based on fossil fuels and, thus, incompatible with ecological limits and environmental sustainability.⁹¹

But the formula of green jobs—like other claims that populate new-generation labour policies—also conceals many pitfalls. The process of defining what a ‘green job’ is cannot be politically neutral. Just like the definition of what decent work is, or what the outcome of just transition should look like, defining green jobs could entail disagreement based on different ideological views. For example, mainstream definitions of green jobs, such as those provided by the International Labour Organization⁹² and the U.S. Bureau of Labor Statistics,⁹³ are entirely focused on reducing the environmental impact of industrial activities or preserving natural resources, thus excluding care work, cooperative work and other forms of collaborative economy in which, although indirectly, the idea of labour as nature’s other can be more adequately deconstructed.⁹⁴

On closer inspection, the definition problem underpins the substantial challenge of building long-term industrial (relations) policies which could pave the way for a metamorphosis of the industrial production system in core sectors,⁹⁵ making decisions in the present that involve externalities whose opportunity cost can only be assessed, communicated and understood in the future.⁹⁶ While in the long-term ‘there is a lot to be won by focusing on

⁹⁰L. Rustico, M. Tiraboschi, ‘Employment Prospects in the Green Economy: Myth and Reality’ (2010) 26 *International Journal of Comparative Labour Law and Industrial Relations* 369–87.

⁹¹See discussions in N. Räthzel, D. Uzzell (eds), *Trade Unions in the Green Economy: Working for the Environment* (London: Routledge, 2013); C. Lipsig-Mumme, S. McBride (eds), *Working in a Warming World* (Ontario: McGill-Queens University Press, 2015); L. Mora Cabello de Alba, J. Escribano Gutiérrez (eds), *La ecología del trabajo. El trabajo que sostiene la vida* (Albacete: Bomarzo, 2015); N. Räthzel, D. Stevis, D. Uzzell (eds), *The Palgrave Handbook of Environmental Labour Studies* (London: Palgrave Macmillan, 2021).

⁹²*Frequently Asked Questions on Green Jobs* (Geneva: ILO, 2019).

⁹³*Ibid.*

⁹⁴A. Zbyszewska, ‘Regulating Work with People and “Nature” in Mind: Feminist Reflections’ (2018) 40 *Comp. Lab. Law & Pol. Journ.* 9–28.

⁹⁵For analysis about the impact of decarbonisation on European energy sector and auto industry, for example, see the contributions collected in B. Galgóczi (ed), *Towards a Just Transition: Coal, Cars and the World of Work* (Brussels: ETUI, 2019).

⁹⁶The idea that *there are no jobs on a dead planet* advocated by the ILO and the international trade union leads in this direction. See ITUC, ‘Climate Justice: There are No Jobs on a Dead Planet’ (2015) 4 *Frontlines Briefing*.

the possibilities that a transition to a sustainable economy with green jobs entails,⁹⁷ in the short-term the issue is more complicated. The emerging low-carbon economy is expected to compensate for the unavoidable job losses in carbon-intensive activities at the level of the whole economy, but the new jobs will not automatically appear at the same time and in the same place where jobs are being lost.⁹⁸ And beyond their formal compliance with decent work standards, these new jobs will not necessarily be sustainable in a life-cycle perspective. They could heavily depend on other ‘invisible’ jobs in industrial operations that are far less decent and green, such as those in the mining industry, to extract the so-called ‘rare earth elements’ or the other critical natural resources needed to feed the parallel technological and ecological transitions of industrial capitalism.⁹⁹

These complexities require labour law and trade unions to support the completion of decarbonisation processes without detracting from the existential values and goals that justify their function in history:¹⁰⁰ that is, without abdicating the mission of emancipating human beings through pathways of solidarity that contrast the market tendency to unbound itself from society. At the heart of industrial society, this mission consisted in making the market more ‘human’ through the humanisation of work. What is required of labour law and trade unions in a post-industrial era is to make work more human through the humanisation of the market. For some, this shift might suggest that labour law and industrial relations institutions should no longer

⁹⁷B. Sjøfjell, ‘The Very Basis of Our Existence. Labour and the Neglected Environmental Dimension of Sustainable Development’, in T. Novitz, D. Mangan (eds.), *The Role of Labour Standards in Development: From Theory to Sustainable Practice?* (Oxford: Oxford University Press, 2011) 125–42, at 138.

⁹⁸B. Galgóczi (note 32) at 19.

⁹⁹See B.K. Sovacool, ‘When Subterranean Slavery Supports Sustainability Transitions? Power, Patriarchy, and Child Labor in Artisanal Congolese Cobalt Mining’ (2021) 8 *The Extractive Industries and Societies* 271–93, B.K. Sovacool, ‘The Precarious Political Economy of Cobalt: Balancing Prosperity, Poverty, and Brutality in Artisanal and Industrial Mining in the Democratic Republic of the Congo’ (2019) 6 *The Extractive Industries and Societies* 915–39, E. Wan, ‘Labour, Mining, Dispossession: On the Performance of Earth and the Necropolitics of Digital Culture’ (2019) 15 *International Journal of Performance Arts and Digital Media* 249–63, S. Taffel, ‘Invisible Bodies and Forgotten Spaces: Materiality, Toxicity, and Labour in Digital Ecologies’ in: Randell-Moon H., Tippet R. (eds) *Security, Race, Biopower* (London: Palgrave Macmillan, 2016) 121–41, N. Tsurukawa, S. Prakash, A. Manhart, *Social Impacts of Artisanal Cobalt Mining in Katanga, Democratic Republic of Congo* (Freiburg: Öko-Institut e.V., 2011).

¹⁰⁰For a labour law discussion on this problem, see the special issue on *Work Regulation and Environmental Sustainability* published in the *Comparative Labor Law & Policy Journal*, Vol. 40, 2018, note 1 and D. Doorey, ‘Just Transitions Law: Putting Labour Law to Work on Climate Change’ (2017) 30 *Journal of Environmental Law and Practice* 201–39.

be focused only on market regulation in which ‘a certain amount of time (the duration of work) is offered in exchange for a certain amount of money (the salary), excluding any claim on the products of the work and the way in which they are made.’¹⁰¹ Far from being reduced only to a regulatory logic focused on protecting humans from the law of supply and demand, labour law and industrial relations institutions should aim to achieve a path of social construction of the market that is broader and more complex. The labour movement is called upon to proactively build the long-term material conditions to influence the demand for (and not just the supply of) skills, orienting it towards the design, development and realisation of socially and environmentally sustainable products and services that contribute to a purposive, more human economy.¹⁰²

For organised labour, this change of attitude could entail a different positioning of collective action within Hyman’s eternal triangle,¹⁰³ with the emphasis of collective bargaining shifting from the 20th century tension between class and market to the post-industrial dialectic between market and society.¹⁰⁴ It is unsurprising that in some industrial relations systems and for some union representation traditions, this repositioning of the union axis generates dismay. And not wrongly so. Class as a symbol and as a collective legal entity has existed and will continue to exist so long as there is a gap between market and society. In the interregnum of the energy transition, where positive aspects and development opportunities coexist with unprecedented risks and vulnerabilities, that gap is far from being filled. Hence, in principle it is acceptable that labour markets should no longer be conceived as the context in which ‘the matching of demand and supply of specific skills takes place, but as *open social systems* where multiple actors

¹⁰¹A. Supiot (note 82) at 37.

¹⁰²N. Bueno, ‘From the Right to Work to Freedom from Work, Introduction to the Human Economy’ (2017) *International Journal of Comparative Labour Law and Industrial Relations* 463–88.

¹⁰³R. Hyman, *Understanding European Trade Unionism: Between Market, Class and Society* (Thousand Oaks: Sage, 2001). See also P. Hampton (note 80), drawing on Hyman’s theoretical framework.

¹⁰⁴For discussion about the role of collective bargaining in promoting environmental sustainability, see A. Bugada et al. (eds.), *Négociation collective et environnement* (New York: LexisNexis, 2021) and C. Chacartegui Jávega, *Negociación colectiva y sostenibilidad medio ambiental. Un compromiso social y ecológico* (Albacete: Bomarzo, 2019). See also the articles published in the special issue ‘Bargaining for Sustainable Development and Just Transition: A Mixed Picture from the ‘Agreement’ EU Project’ (2021) 10 *E-Journal of International and Comparative Labour Studies*.

cooperate in order to create the conditions for a just transition,¹⁰⁵ this idea remains a normative proposal that in most cases is still yet to bear fruit.

7. TRANSITIONARY DILEMMAS

Novel discourses about labour law evolution in the face of contemporary energy, environmental and social challenges are as persuasive as controversial. For example, anchoring labour law to the idea of sustainable development, in the particular perspective offered by the theory of *capabilities*,¹⁰⁶ renders it possible to fully grasp the close nexus between the three pillars of sustainability: the economic, social and environmental. Yet, although the ‘capability approach’ advanced by Amartya Sen sees the extension of markets or the economic growth as means to enhance individual capabilities and human development,¹⁰⁷ in the context of decarbonisation policies, the core normative vision of development as freedom¹⁰⁸ proves to be realistic in both its positive and, more noticeably, dramatic consequences.

On the one side, empirical evidence shows that development is a prerequisite for a just transition. Justice in the transition to a zero-carbon economy depends on the capacity of the sectors and local communities affected by decarbonisation to offer workers concrete professional alternatives both within and outside the productive labour market.¹⁰⁹ The free choice of labour, in particular, is decisive for workers to prefer green jobs over environmentally and socially unsustainable jobs, but active labour market

¹⁰⁵L. Casano, ‘Skills and Professions for a “Just Transition”: Some Reflections for Legal Research’ (2019) 8 *E-Journ. of Intern. and Comp. Lab. Stud.* 31–46 at 42.

¹⁰⁶D. Doorey (note 100) at 227–30; S. Deakin (note 3). For wide discussion about the role of labour standards in sustainable development, and the implications with the capability approach, see B. Caruso, R. Del Punta, T. Treu, *‘Manifesto’ for a Sustainable Labour Law* (Catania: Centre for the Study of European Labour Law ‘Massimo D’Antona’, 2022) and T. Novitz, D. Mangan, ‘An Introduction to the Role of Labour Standards in Development. From Theory to Sustainable Practice?’ in T. Novitz, D. Mangan (eds.), *The Role of Labour Standards in Development: From Theory to Sustainable Practice?* (Oxford: Oxford University Press, 2011) 1–15, at 7. For a recent, broader variation on the capability approach, see the essays collated in B. Langille (ed.), *The Capability Approach to Labour Law* (Oxford: OUP, 2019).

¹⁰⁷S. Deakin (note 3) at 171.

¹⁰⁸A. Sen, *Development as Freedom* (Oxford: OUP, 2001).

¹⁰⁹D. Snell, ‘“Just Transition”? Conceptual Challenges Meet Stark Reality in a “Transitioning” Coal Region in Australia’ (2018) 15 *Globalizations* 550–564; M. Soder, K. Niedermoser, H. Theine, ‘Beyond Growth: New Alliances for Socio-ecological Transformation in Austria’ (2018) 15 *Globalizations* 520–35; J. Abraham, ‘Just Transitions for the Miners: Labor Environmentalism in the Ruhr and Appalachian Coalfields’ (2017) *New Political Science* 218–40.

policies should not be idealised: they are successful as long as a dynamic labour market exists. The existence of transparent and competitive labour markets is a key factor in guaranteeing a just transition, as is the presence of a cohesive social context in which being unemployed does not necessarily lead to social exclusion but rather opens up the possibility of emancipation and human development that is not dependent on professional status.

On the other side, unjust transition tends to materialise in areas bearing the typical characteristics of underdevelopment,¹¹⁰ where a monopsony structure of labour markets is associated with pre-existing high rates of unemployment, with the inefficiency of local institutions in planning pathways for education and training aligned with medium- to long-term employment needs, with a lack of infrastructure and industrial policies capable of promoting geographical mobility and attracting investments necessary for re-conversion, redevelopment and reclamation of disused production areas or those in a state of conservation.¹¹¹ Far from being heirlooms of remote industrial societies, these conditions of vulnerability are directly or indirectly associated with three labour market features, typical of fossil-fuel and nuclear industries in existing advanced and developing economies, in which workers and local communities might become subject to political manipulation or environmental abuses:¹¹² the *company town*, where the workers generally have no choice about where they live, and the influence of the employer permeates their lives beyond the eight hours of work; the *captive community*, where independent businesses, housing, and other commercial facilities exist, but the community is still dependent upon a single corporate entity that operates a major industrial plant in the area; the *urban industrial community*, where the proximity of the homes of many workers to their place of work, make them affected by pollution emanating from their employers' industrial facilities.

For the purpose of realising social justice in the transition away from fossil-fuels, these market conditions preclude any possibility to turn the normative claims of capabilities into reality in the short-term.¹¹³ And the

¹¹⁰S. Barca, E. Leonardi, 'Working-class Ecology and Union Politics: a Conceptual Topology' (2018) 15 *Globalizations* 487–503.

¹¹¹P.-Y. Oei, H. Brauers, P. Herpich, 'Lessons from Germany's Hard Coal Mining Phase-out: Policies and Transition from 1950 to 2018' (2020) 20 *Climate Policy* 963–979.

¹¹²J.C. Holdham, 'Organized Labor, the Environment, and the Taft-Hartley Act' (1973) 71 *Michigan Law Review* 935–1040, at 946–52.

¹¹³The time frame of the transition, in fact, is crucial to determine the possibility to achieve balanced outcomes: B. Galgóczi (note 32) at 26.

same goes for the procedural conceptions of sustainable development¹¹⁴ and just transition,¹¹⁵ that underestimate structural constraints and power imbalances inherent in transitional dilemmas. The more dramatic experiences of decarbonisation show that, instead of being individually or collectively empowered to make meaningful choices and freely participate in the social construction of sustainable labour markets, workers and communities are fully dependent on the fossil-fuels (or nuclear) economy and, despite procedural justice being formally recognised, they have no other option than to adapt to its demands, imposed upon them from outside, and which they can hardly influence. Arguably, this explains why governments, judges and unions in Western jurisdictions tend to avoid radical solutions to decarbonisation processes. This makes also evident how difficult it is for both public authorities and industrial relations institutions to envisage concrete alternatives to the continuation of industrial activity based on fossil-fuels—alternatives that are sustainable for both local communities and the environment, without externalising the social and environmental costs of decarbonisation elsewhere, notably in those areas of the Global South which have been ‘blessed’ (or ‘condemned’, depending on the points of view) with generous natural resources.¹¹⁶ Similarly, heavy environmental regulations in developing countries risk to turn thousands of workers dependent on the fossil fuel economy into a new form of ‘ecological refugee’.¹¹⁷

In these contexts, transitional dilemmas become more accentuated and unions are on the defensive. Even if in principle they refuse the ‘job vs environment blackmail’¹¹⁸ and accept the integration of environmental sustainability in their industrial relations agendas, they are still dependent on firms’ monopsony power when private investment is necessary to close

¹¹⁴Novitz, for example, sees sustainable development as a ‘full, inclusive and participatory process, representing a range of those interested in the distributional and other aspects of the policies to be adopted’: T. Novitz (note 87) at 465.

¹¹⁵See ILO, *Guidelines for a just Transition Towards Environmentally Sustainable Economies and Societies for All*, 2015 and B. Galgóczi, ‘Just Transition Towards Environmentally Sustainable Economies and Societies for All’ (2018) *ILO ACTRAV Policy Brief*.

¹¹⁶For a Global South perspective on the just transition, see M. Pucheta, C.A. Alonso, S. Sánchez, ‘Just Transition and Workers’ Rights in the Global South: The Recent Argentine and Chilean Nationally Determined Contributions’ (2021) 13 *Sustainability* 1–15, and the many contributions about Africa, Asia and South America collated in N. Räthzel, D. Stevis, D. Uzzell (eds), *The Palgrave Handbook of Environmental Labour Studies*, cit.

¹¹⁷A. Chomsky, ‘Labor and the Environment in Latin America’ (2016) *Oxford Research Encyclopedia of Latin American History*.

¹¹⁸R. Kazis, R. L. Grossman, *Fear at Work: Job Blackmail, Labor and the Environment* (New York: The Pilgrim Press, 1982).

the transition. Heavy public debt and low capacity to attract investments make transitional options even tighter, pushing governments, judges and unions to ‘praising work’ and putting unlimited trust in the saviour role of private investment.¹¹⁹ Yet, although disapproving arguments for radical socio-ecological transformation as ‘utopian’ and ‘unrealistic’ is often a way of upholding the status quo, it is imprecise to say that the immediacy of material concerns prevails over values and long-term programmes in industrial relations policies.¹²⁰ The realistic turn taken by public authorities and unions in many transitional cases is the result of evaluations that see partnership with private capital as the best road to combine environmental and labour protection, especially if public resources are unavailable or insufficient.¹²¹

This is why the resources allocated by governments and the European Union as part of its *Green Deal*—amongst which is the establishment of the *Just Transition Fund* and other policy mechanisms to contrast the social and employment impact of the energy transition—are primarily aimed at supporting transitional pathways throughout the areas and sectors that are most vulnerable to fossil-fuels or carbon-intensive processes.¹²² But in order to avoid dependency effects, and the consequence that these policies become giants with feet of clay, they must be considered as a piece of a larger mosaic, which goes far beyond income support, redundancy measures, early retirement plans or the mere matching between the demand and supply of labour from fossil-fuels to green jobs, and recreates, under modern conditions, the institutional basis for organised labour to regain social control over energy production and consumption at a both local and global level. Alongside the activation and implementation of passive and active labour market policies, even though indispensable in handling the short-term effects of the energy transition on employment,¹²³ eradicating the root causes

¹¹⁹ See, for example, the Ilva case in southern Italy: P. Tomassetti, ‘From Treadmill of Production to Just Transition and Beyond’ (2020) 26 *European Journal of Industrial Relations* 439–57.

¹²⁰ D. Snell, P. Fairbrother, ‘Unions as Environmental Actors’ (2010) 16 *Transfer* 411–24, at 422.

¹²¹ A. Mah, *Industrial Ruination, Community and Place: Landscapes and Legacies of Urban Decline* (Toronto: University of Toronto Press, 2012).

¹²² European Commission, *The European Green Deal*, COM (2019) 640 final, Bruxelles, 11.12.2019, at 1 and 16. See also European Commission, *Proposal for a Council Recommendation on ensuring a fair transition towards climate neutrality*, COM (2021) 801 final, 14.12.2021.

¹²³ The importance of passive and active labour market policies is emphasised in all the contributions collected in B. Galgóczi (eds) (note 97). For discussion on this aspect, articulated within the flexicurity framework, see also N.S. Ghaleigh, ‘Just Transitions for Workers: When Climate Change Met Labour Justice’, in A. Bogg, J. Rowbottom, A.L. Young (eds), *The Constitution of Social Democracy. Essays in Honour of Keith Ewing* (Oxford: Hart, 2020) 458–75, at 469–71.

of labour (and environmental) vulnerability is necessary to imagining any post-industrial (relations) vision of organised labour that could break the corporate domination on energy and to help society apply the power of public governance to the creation of a new democratic energy system that can truly serve human welfare and advance working conditions in a way that is compatible with ecological limits.

8. THE CASE FOR A COMMUNITY-BASED ENERGY MODEL

Regardless of the formal pledges that world leaders make from summit to summit, decarbonisation of industrial capitalism is going to be a long and winding path. The reality is that renewable energy sources are not yet able to meet the current demand for energy in the industrialised world. Because green technologies and infrastructures are neither ready nor accessible for all, natural gas and other fossil fuels retain some competitiveness. All the while, climate change policies point in the opposite direction and, ironically, make the production and distribution of conventional energy even more expensive, affecting real wages negatively and leaving millions of vulnerable workers at risk of energy poverty.¹²⁴

The spectrum of social conflict over the energy transition, though, should not be used as an expedient to delay more democratic alternatives to fossil fuels and nuclear corporations' strongholds. Trade unions and other social forces should be vocal on this. Without democratising energy production, distribution and consumption, labour law and industrial relations institutions are vulnerable to fossil fuels. They are fated to praising work and bending wage bargaining to chase energy prices. Technological progress will be a decisive factor in facilitating the democratisation of the energy system, opening up potential for renewable energy generation and access. No less important are the institutional, political and legal variables which will be needed in the process of concluding the energy transition and building the society that future generations of workers and citizens deserve. Just as the relationship between humanity and nature is socially and legally constructed, 'so we must also look to social and, indeed, legal inquiry for answers.'¹²⁵

¹²⁴A.J. Bradbrook, J.G. Gardam, 'Placing Access to Energy Services within a Human Rights Framework' (2006) 28 *Human Rights Quarterly* 389–415; M. González-Eguino, 'Energy poverty: An Overview' (2015) 47 *Ren. and Sust. En. Rev.* 377–85.

¹²⁵S. Deakin (note 3) at 121.

In 1976, energy policy analyst Amory Lovins coined the term ‘soft energy path’ to describe an energy model alternative to the existing one—the ‘hard path’—based on fossil and nuclear fuels.¹²⁶ The two paths are, according to Lovins, ‘logistically competitive, institutionally incompatible, and culturally antithetical.’¹²⁷ What ultimately distinguishes them is not their different technical and economic structure, but their diverse socio-political impact. While conventional energy production implies large economies of scale where only big corporations can compete, resulting in uneven distribution of its impacts and unequal power relations entailing very few co-determination opportunities for workers and communities, new technologies enable the power of solar energy and its derivatives to be produced on a scale that matches its use, thus eliminating the need for heavy transmission systems.¹²⁸ By decentralising the grid and incentivising people to produce their own power from wind, solar rays, and biomass, the socioeconomic dynamic induced by fossil-fuels can be therefore turned upside down: from the closed, hierarchical and globalised stronghold of oil, natural gas and nuclear corporations, to the localised, open and democratised post-industrial ‘soft energy path’ based on solar power.

Arguably, the decentralisation and democratisation of the energy grid will require two normative conditions to be met: social control over global value chains of the technologies used to drive the energy transition, and a parallel shift in property rights.

The first condition is needed to anticipate, and possibly contrast, the risk that comes with enabling technologies for self-production of energy through renewables and decentralised grids, if they will continue to rely on violations of human rights and environmental standards, which occur both in mining activities and in the waste-disposal operations outsourced to vulnerable workers and communities in the Global South.¹²⁹ In spite of their seeming invisibility, the mining and waste disposal industries play a fundamental role in the reproduction of global value chains, including those driving the decarbonisation of industrial capitalism. While providing raw materials to the downstream industries and disposing waste flowing from technological production and consumption, the components of energy technologies are

¹²⁶ A.B. Lovins, *Soft Energy Paths: Towards a Durable Peace* (New York: Harper & Row, 1979).

¹²⁷ A.B. Lovins (note 126) at 49.

¹²⁸ A.B. Lovins (note 126) at 55. See also B. Commoner (note 38) at 11.

¹²⁹ In addition to E. Wan (note 99), S. Taffel (note 99) and J. Hickela et al. (note 78), see S. A. Khan, ‘Struggles and Actions for Legal Space in the Urban World: The Case of Informal Economy E-waste Workers’ (2018) 33 *Canadian Journal of Law and Society* 115–35.

‘embodiments of labour power’ performed by invisible workers in invisible places.¹³⁰ Such extractive and waste-disposal operations entail a variety of social and environmental risks, including commodification of men and women involved in mining and urban mining work activities, deterioration of ecosystems, as well as soil, air and water pollution.

This is probably the most critical challenge governments, unions, and civil society in the industrialised world must face in turning the normative dimension of a just transition into a new reality. This will require, in turn, a reassertion of the role of labour standards in promoting sustainable development.¹³¹ To realise this aim, it is certainly important to shed light on the formal responsibility of undertakings and use, for example, the lever of ‘due diligence obligations’ to make the value chain more responsible and sustainable, from the point of view of the Western idea of legality. But this is not sufficient and can even be counterproductive.¹³² Just as with the concept of ‘informality’, the analytical weakness of the notion of ‘illegality’ lies in the fact that, in developing countries, legal activities tend to coexist with and within illegal operations. The boundaries between the two spheres can be so blurred to be hardly distinguishable.¹³³ In this context, evidence suggests that, on the one side, traceability can be virtually impossible. Even state agents and local union representatives tend to label as legal mining and waste-disposal activities connected to banned operations.¹³⁴ On the other side, some extractive activities that are formally qualifiable as unlawful, are not necessarily unsustainable. On the contrary, they can contribute to poverty reduction, community development and emancipation of vulnerable people.¹³⁵

In addition to strategic litigation and legal mechanisms to enforce international labour (and environmental) standards, it is therefore of equal

¹³⁰A. Hornborg, ‘The Commodification of Human Life: Labour, Energy and Money in a Deteriorating Biosphere’, in N. Räthzel, D. Stevis, D. Uzzell (eds), *The Palgrave Handbook of Environmental Labour Studies*, cit., 677–97, specifically at 695.

¹³¹T. Novitz, D. Mangan (eds.) (note 106).

¹³²Deakin argues that ‘the simple transplantation, without more, of the labour law systems of developed systems into developing country contexts could lead to a severe mismatch between regulatory mechanisms and the social and economic environments in which they were intended to function.’ S. Deakin (note 3) at 168.

¹³³A. Trebilcock, ‘Using Development Approaches to Address the Challenge of the Informal Economy for Labour Law’ in G. Davidov, B. Langille (eds), *Boundaries and Frontiers of Labour Law. Goals and Means in the Regulation of Work* (London: Hart Publishing, 2006) 63–86, here at 65.

¹³⁴See for example the case of artisanal cobalt mining in the Democratic Republic of Congo: N. Tsurukawa et al. (note 99) at 12.

¹³⁵B.K. Sovacool (note 99) at 287–8.

importance to investigate and eradicate the root causes of commodification of labour and natural resources, at the point where the global value chain of the energy transition is weakest, and where workers and communities are most vulnerable. Many of these issues are out of the scope of labour law.¹³⁶ But beyond their conventional standard-setting functions and formal remedies, governments and the ILO have the potential to realise the developmental capacities of vulnerable countries by using the promotional lever.¹³⁷ Programmes like the ILO's PAEJK project in the Democratic Republic of Congo are notable examples of how technical cooperation can promote sustainable development of local communities and pathways for human emancipation and capability.¹³⁸

The second condition for a sustainable energy transition points to the risk that the decentralisation of the grid could generate inequalities and lead to a neo-feudal type of socioeconomic model. Especially in countries with intensive housing, little sunlight, and where accommodation is rented, decentralised grids based on home property, for example, could result in discriminatory effects on vulnerable groups, preventing them from exercising their right to democratic participation in the generation and consumption of energy. The EU and other jurisdictions have recently enacted new legislation providing a legal framework that can help to surmount such a hurdle.¹³⁹ In the wake of the Paris agreement and the UN Agenda 2030, the vision of a climate-neutral Europe (and planet) by 2050 advocated by the European Commission pushes not only towards decarbonisation but also towards self-produced energy coming from solar power and other correlated renewable sources. A leading role is given to the activism of local communities and to citizen-consumers availing themselves of self-produced energy. In consuming energy they will also be exercising fundamental rights and freedoms

¹³⁶Think, for example, about foreign policy of industrialised countries that systematically destabilise vulnerable regions in the Global South to exploit and keep them under domination.

¹³⁷For discussion about this argument, see B. Langille, 'Human Freedom and Human Capital: Re-imagining Labour Law for Development' in T. Novitz, D. Mangan (eds.) (note 106), 28–38, especially at 33.

¹³⁸The ILO's PAEJK project offered nearly 20,000 young Congolese people in Katanga province apprenticeships, and professional and entrepreneurship training to support their integration into the workforce. For details, see F. Bazin, O. Renard, M. Katya, *Filières porteuses et emploi des jeunes au Katanga. Projet PAJEK/ BIT* (Geneve: ILO, 2017).

¹³⁹See E. Caramizaru, A. Uihlein, *Energy Communities: An Overview of Energy and Social Innovation* (Brussels: Publications Office of the European Union, 2020). Regarding the US, see R. Parks, 'Microgrids: Legal and Regulatory Hurdles for a More Resilient Energy Infrastructure' (2018) *Pace Envtl. L. Rev.* 173–201.

regarding housing, mobility, transport, and access to essential goods and services, and acting with a view to countering the increasing scourge of energy poverty induced by escalating fossil-fuel prices.¹⁴⁰

With the Clean Energy Package, energy communities received full recognition and protection under the EU law.¹⁴¹ Rather than seeking to generate financial profit, ‘citizens energy communities’ aim to provide environmental, economic or social community benefits not only to their members or shareholders, but also to the local areas where they operate. Based on voluntary and open participation, they should be effectively controlled by members or shareholders that—irrespective of their ownership status—are natural persons, local authorities, or small enterprises.¹⁴² Likewise, the Renewable Energy Directive requires national legislators to provide an enabling framework for the development of ‘renewable energy communities’, ensuring *inter alia*, that participation in the communities is accessible to all consumers, including those in low-income or vulnerable households;¹⁴³ rules to secure the equal and non-discriminatory treatment of consumers that participate in the community are in place.¹⁴⁴

Although the prospect of a total disconnection from centralised industrial grids is still difficult to imagine, energy cooperatives and communities could prove to be a realistic alternative in achieving independence for individuals, families and small businesses that exchange surplus energy with others through local forms of collective generation and auto-consumption with other users in the area, thus offering great potential for the relocation of the energy power around human-scale economies rooted more closely in the communities they serve. In addition to providing access to affordable clean energy, community-based energy models can give people a voice to decide on power generation and distribution.¹⁴⁵ Evidence documents cases of firm-based energy cooperatives jointly established by employees and management

¹⁴⁰ See European Commission, *A clean planet for all. A European strategic long term vision for a prosperous, modern, competitive and climate neutral economy*, COM (2018) 773 final, at 10.

¹⁴¹ Within the Clean Energy Package, see Articles 2(11) and 16 of the so-called e-Directive (Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market in electricity) about ‘Citizens Energy Communities’, and Article 22 of the so-called Renewable Energy Directive (Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources) about ‘Renewable Energy Communities’.

¹⁴² Article 2(11) (note 141).

¹⁴³ Article 22(4)(f) (note 141).

¹⁴⁴ Article 22(4)(i) (note 141).

¹⁴⁵ ILO, *Providing Clean Energy and Energy Access through Cooperatives* (Geneva: ILO, 2013).

that provide renewable energy even to industrial plants.¹⁴⁶ The flourishing of renewable-energy cooperatives and communities in many EU countries, North America and in the Global South provide an example of a successful alternative economy, usually characterised by some form of democratic control or shared ownership by the people and communities involved,¹⁴⁷ that shows how democratising the power of energy sources can make an important contribution to sustainable development and its social acceptance.¹⁴⁸ In marking the transition from an extractive energy system to one that is generative and participatory, the spread of renewable energies and the promise of community-based energy models might facilitate the restoration of viable connections between human beings and other forces of nature, involving a sense of limitation and responsibility, an opportunity to savour a return to authentic forms of solidarity and to political, economic and social participation.

True: there is no guarantee that the implementation of a decentralised energy system will automatically lead to such benefits. Signs of regression are already visible, and critical scholars argue that the real capacity of community energy initiatives to contrast the profit-based energy system is at best minimal.¹⁴⁹ Also, a recent literature review on community energy models documents a growing focus of such institutions on economic objectives rather than on their social and political goals, which risks ‘blurring their distinctiveness from more commercial actors and diluting the unique contributions that they could make in advancing just energy transitions.’¹⁵⁰ Active engagement

¹⁴⁶A notable example is the renewable energy cooperative established at Volkswagen plant in Emden: see M. Allbauer, *Belegschaftsgenossenschaften für regenerative Energien* (Düsseldorf: Hans-Böckler-Stiftung, 2013). For broader discussion on employee energy cooperatives in Germany, see A. Shadabi, C. Herbes, ‘Employee Energy Cooperatives: Employee Entrepreneurial Activities Towards a More Sustainable Future’ in K. Nicolopoulou et al. (eds) *Sustainable Entrepreneurship and Social Innovation* (New York: Routledge, 2016) 338–51.

¹⁴⁷S. Moroni et al., ‘Energy communities in the transition to a low-carbon future: A taxonomical approach and some policy dilemmas’ (2019) 236 *Journal of Environmental Management* 45–53.

¹⁴⁸B. Klagge, T. Meister, ‘Energy Cooperatives in Germany—An Example of Successful Alternative Economies?’ (2018) 23 *Local Environment* 697–716, with insights on work organisation at 705. See also the cases presented and discussed in D. Fairchild, A. Weinrub (eds), *Energy Democracy: Advancing Equity in Clean Energy Solutions* (Washington: Island Press, 2017) and C. Morris, A. Jungjohann (eds) *Energy Democracy. Germany’s Energiewende to Renewables* (London: Palgrave Macmillan, 2016).

¹⁴⁹S. Sweeney, J. Treat, I. HongPing Shen, ‘Transition in Trouble? The Rise and Fall of ‘Community Energy’ in Europe’ (2020) 13 *Trade Unions for Energy Democracy—Working Paper* 1–45.

¹⁵⁰T. Bauwens et al., ‘Conceptualizing Communities in Energy Systems: A Systematic Review of 183 Definitions’, forthcoming in *Renewable and Sustainable Energy Reviews*, at 14.

and voice for social actors in how energy is generated, distributed and consumed are even more needed, therefore, to put renewable energy sources at the service of labour and communities.¹⁵¹ This is probably the last best resort workers have to regain the power to switch off the energy flow that fuels the market economy. Greater independence from and influence on the energy market could give organised labour and communities the capability to contrast the root causes of energy poverty, allowing them to steer the sustainable development of the post-industrial society, while maintaining the market space embedded within the broader socio-ecological one.

The pathways and outcomes of this process are hardly predictable. Certainly, current socio-technical conditions prevent Twenty-first century trade unions from retracing the miners' *modus operandi* in the coal age. Consider the strike, for example. Renewable energy cooperatives and communities normally do not hire any direct employees.¹⁵² But alternatives to traditional logics of collective action may be envisioned, if we accept the need 'to reframe our understanding of collective bargaining to fully incorporate within it several phenomena that are rooted in the pursuit of solidarity'.¹⁵³ Learning from unions' engagement in shareholder activism through pension funds,¹⁵⁴ for example, labour participation in and control over decentralised energy systems could be used to make management accountable towards workers and ecosystems, by negotiating conditions to access the energy market, sanctioning or even excluding companies engaged in unfair practices from community energy initiatives. The tariff schemes set by energy cooperatives and communities could be designed to incentivise local manufacturing, along with investments in the circular-economy and welfare measures for workers and local communities. Tariffs can be designed with rates and conditions that guarantee prevailing union wages, which in turn, could be complemented by collective bargaining agreements linking pay rises to energy efficiency and conservation.

¹⁵¹S. Sweeney, *Resist, Reclaim, Restructure: Unions and the Struggle for Energy Democracy* (New York: Rosa Luxemburg Stiftung, 2013) at 30.

¹⁵²Ö. Yildiz, J. Radtke, 'Energy Cooperatives as a Form of Workplace Democracy? A Theoretical Assessment' (2015) 16 *Economic Sociology—The European Electronic Newsletter* 17–24, at 21.

¹⁵³J. López López, 'Introduction', in J. López López (ed.), *Collective Bargaining and Collective Action. Labour Agency and Governance in the 21st Century?* (London: Hart, 2019), at 5.

¹⁵⁴For extensive analysis of this practice, see S. M. Jacoby, *Labor in the Age of Finance. Pension, Politics, and Corporations from Deindustrialization to Dodd-Frank* (Princeton: Princeton University Press, 2021) and D. Webber, *The Rise of the Working-Class Shareholder. Labor's Last Best Weapon* (Cambridge: Harvard University Press, 2018).

These are a few examples of how Twenty-first century trade unions might rediscover a source of power in the energy market, to augment their power within the labour market. And many others could come from the creativity of social forces and their ‘living law’. Labour’s struggle for the democratisation (and decarbonisation) of the economy ‘requires a new, imaginative—indeed utopian—counter-offensive: a persuasive vision of a different and better society and economy, a convincing alternative to the mantra of greed, commodification, competitiveness and austerity, a set of values which connects with everyday experience at the workplace and in the community’.¹⁵⁵ If the re-socialisation of the political and economic power of energy is to lead to a reduced dependence on unsustainable and unpurposeful labour markets, the change ahead could contribute to creating new spaces for democracy, freedom and sustainable coexistence between humans and nature. This could be a significant step forward in the direction of reconceptualising labour law and industrial relations institutions according to an ‘ergology-based’ idea of work.¹⁵⁶ It could be a way to build a more human economy,¹⁵⁷ in which work is considered as human activity,¹⁵⁸ recognising that the true character of labour and natural resources is that of being a commons, at the service of the common good.¹⁵⁹

¹⁵⁵R. Gumbrell-McCormick, R. Hyman, ‘Democracy in Trade Unions, Democracy through Trade Unions?’ (2019) 40 *Economic and Industrial Democracy* 91–110, at 107.

¹⁵⁶According to Supiot, such ‘ergology-based’ conception of work implies restoring ‘the hierarchy of means and ends by indexing the status of the worker to the nature of the task to be undertaken, and not to its financial product’: A. Supiot (note 2) at 10.

¹⁵⁷N. Bueno (note 106).

¹⁵⁸S. Routh, ‘Embedding Work in Nature: The Anthropocene and Legal Imagination of Work as Human Activity’ (2018) 40 *Comp. Lab. Law & Pol. Journ.* 29–60.

¹⁵⁹A. Zbyszewska (note 94). See also G. A. García-López, ‘Commoning Labour, Labouring the Commons: Centring the Commons in Environmental Labour Studies’, in N. Räthzel, D. Stevis, D. Uzzell (eds) (note 130), 389–414.