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Climate change and construction labour

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Contents

Note from the Editor	4
Subject articles	6
• Linda Clarke and Colin Gleeson: <i>Introduction</i>	6
• Günter Moewes, <i>Evolution in reverse</i>	8
• Peter Glynn, <i>Employment issues arising from climate change policy and the role of electrical contractors association and trade unions</i>	17
• Nathan Lillie, Markku Sippola, Lisa Berntsen, <i>A Tale of Two Power Plants</i>	23
• Vassil Kirov, Monique Ramioul, Hans Torvatn, Jan Van Peteghem, <i>What is the impact of 'Greening' on the Construction social dialogue?</i>	31
• Jan Van Peteghem, Monique Ramious, <i>The Belgian eco-friendly construction sector: definitions and impact</i>	40
• John Calvert, <i>Climate Change, Construction and Labour in Europe</i>	46
• Nasser Golzari, <i>Sustainable growth; energy construction in a no-growth economy: Gaza</i>	48
Research Reports	54
• Colin Gleeson, <i>Retrofitting housing</i>	54
• Carla Lipsig-Mummé, <i>Work in a Warming World (W3): a Canadian research programme on climate change and work</i>	63
Review Essay	68
• Colin Gleeson on Olivier & Simmond's <i>Less is More: Energy security after oil</i> (in press)	68
Reviews	74
• Carla Lipsig-Mummé et al, <i>What do we know? What do we need to know? The State of Canadian Research on Work, Employment and Climate Change</i>	74
• Daniele Di Nunzio, Giuliano Ferrucci and Salvo Leonardi, <i>The precarious nature of knowledge professionals in Italy?</i>	80
• Peter Tom Jones and Vicky De Meyere, <i>Terra Reversa. De transitie naar rechtvaardige duurzaamheid.</i>	83
• John Huige and Lou Keune, <i>Plan voor een Duurzame en Solidaire Economie in Nederland.</i>	83
• Humphrey McQueen, <i>We Built This Country: Builders' Labourers & Their Unions 1787 to the Future</i>	85
• Guy Standing, <i>The Precariat. The new dangerous class</i>	87

Note

from the editor

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The content of this issue is again a demonstration of the 'high potential' of European and international networking. Sub-editor Colin Gleeson, together with Linda Clarke, has collected an interesting panorama of subject articles that deals with the need for what is called by several authors a 'New Green Deal', and is by others seen as a complete break with the past of economic growth and businesses dominated by financial capitalism and short termism. And, finally, for some it is no less than the only way out of the actual crisis. Next to authorities in the field we also received contributions from newcomers, notably in the review sections.

The theme of this issue is related to important question marks that the construction industry will have to face in the actual economic turmoil: is it possible for a contractor, not to say for a whole industry, to transform into a productive entity that is sustainable, based on long term strategies, not on boom and bust? What are the consequences of the option for complete regeneration and a farewell to

a long tradition of relative neglect of environmental concerns? And what about the consequences for the most involved actor and stakeholder, the workforce?

The contributors to this issue have not come up with the ultimate answers in this area, but at least they have raised the questions. And that is far more than important and dominant parts of the industry actually do. Often some lip service is paid but the slogan 'sustainable growth' most often must be read as: more economic growth so that we can build again. The industry abstains from further structural reflections and so do the trade unions. Even the EF-BWW, the European umbrella organisation of building and woodworkers unions, so far stayed rather vague about the trade unions' political intentions in this area.

In the new Action Program 2012-2015 *Building a Social and Green Europe*, adopted in December 2011 in Palermo, the Federation spends the sections 1.17 to 1.22 on the need to formulate a new policy for the industry related to sus-

tainability. First, the EFBWW believes that the construction and wood sectors are key sectors for Europe to live up to its climate change commitments. Buildings account for approximately 40 percent of greenhouse gas emissions as well as primary energy consumption in the EU. And an increased use of wood as building material would by itself reduce greenhouse gas emission, since wood is a carbon neutral and renewable material that stores carbon. In the following sections, the Federation asks for the extension of the present requirement to reduce greenhouse gas emissions in order to reach zero energy standards by 2020 in all new buildings and also the existing building stock. What is needed is a policy of energy-efficiency and the promotion of the use of environmentally sustainable building products based on a 'life cycle approach', taking into account the costs over the whole life cycle of the product. However, in the section dedicated to the priorities for the building sector in the years to come, these expressed engagements are not made operational.

With this issue of CLR-News we make a start in bridging the gap. Therefore, a warm welcome to the re-elected leadership and secretariat of EFBWW – there is serious work to do.

Subject articles

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INTRODUCTION

From the UNFCCC to EU policy, to the Stern Report the focus is on reducing carbon dioxide (CO₂) emissions. Buildings are responsible for some 40% of EU emissions and energy use in buildings is therefore a central issue for the construction sector. To effectively respond to EU emission target reduction of 80% reduction by 2050 will mean that the future trajectory of Europe's energy supply and demand will be the major construction issue over the next 40 years. Requirements to create low carbon buildings relate to all aspects of construction, including design communication, contractual relations, site management, operative skills and post occupancy management. Construction researchers need to identify, among other things, vocational education and training (VET) demands for the inevitable new renewable generation built to replace existing coal and oil fired power stations, as well as identifying the full impact of widespread retrofitting in order to reduce energy wastage in buildings. This research will include assessment, planning, project management and installation with particular attention paid to the problem of demarcation/interfaces. Retrofitting teams are required who have the trust and respect of occupiers along with pride and self-confidence in their skills to achieve a hugely significant societal impact. To support the retrofitting process thermal literacy must be embedded at all levels of construction training, for designers and installers and, indeed, eventually even extended to schools where children will then teach their parents about efficient energy use and thus close the loop.

The problem however is that skill requirements for this cannot simply be pinpointed and training provided in the form of a short term technical 'fix', without consideration of the context in which young people enter the construction industry, VET provision available, the possibilities of work experience and developing a career, and the prevailing employment and working conditions. Two research findings are relevant to this. First, that heat loss from dwellings is above all related to interfaces

between different trades and occupations, between, for instance, the work of the carpenter fitting doors and the bricklayer the walls or between the groundworker laying foundations and the bricklayer the walls. Secondly, that where a low energy retrofit occurs, typically four interventions provide the bulk of energy saving: roof insulation, condensing boiler and controls, wall insulation and photovoltaics. Each of these requires integrated and coordinated teamworking between different trades, between the electrician and the plumber, the bricklayer and the groundworker and the roofer and carpenter.

If low carbon construction is to be achieved, the approach to VET in many countries, and particularly in the UK, needs to be formulated through involvement of all stakeholders, including social partners and educationalists; embrace wide occupational profiles similar to those found in countries such as Germany; and conceive programmes as developing the capacity of the individual rather than simply concerned to impart skills for the immediate task of reducing particular heat loss in specific parts of the building envelope. The threat of global warming offers the opportunity to readdress multiple social targets alongside VET including the democratisation of energy supply and thermal comfort at affordable prices – ending fuel poverty.

The articles in this CLR News raise many fundamental and wide-ranging labour issues concerning both energy construction and saving energy, including the need for a rethink on VET and industrial relations and the problems attached to growth strategies and the notion of 'green jobs'. Research in this area is till now limited; indeed there often seems like a yawning gulf between technical construction solutions to climate change and the social and employment context in which these have to be situated. The Canadian project *Work in a Warming World*, which is introduced here, is an exemption in seeking to bridge this gap and to show the urgent and far reaching changes needed in construction employment and VET in the light of climate change.

Guenther
Moewes

EVOLUTION IN REVERSE

<http://www.zeitschrift-humanwirtschaft.de> - 04/2007

In the beginning the Earth was formless and empty. It was made of combustion waste. In the course of billions of years nature has decomposed this waste. Applying the energy of the sun, it has turned the dead planet into the potentials of this Earth: the minerals, resources, raw materials, oxygen, carbon hydrates, huge deposits of coal and oil, the wonders of species variety, of a bird's eye, and of intelligence. This process is called 'evolution'. After four billion years human intelligence had advanced far enough to realise the dream of millennia: the transfer of human labour to machines. More and more machines produced more and more affluence despite less and less human labour. This process is called 'industrialisation'. Man managed to turn both processes into their opposites. In just 150 years he 'reprocessed' the majority of the resources and their potentials, including great chunks of species variety, built up over four billion years, into waste again, for ever inseparable. And as to the dream of liberation from work and toil, he turned it into the curse of 'unemployment'. This process is called 'capitalism'.¹

How could this happen? Now then, capitalism had invented a construct, which turned not only evolution and industrialisation on its head but also the entire economy: the expansion of money without productive output. This invention channels all money, earned by those more and more machines, exclusively into the pockets of the owners of money. Every day new contraptions were invented to perfect this process of unproductive siphoning off money from the creation of real value, via good old exponential compound interest, hedge funds, REITs, and private equity. Below the tele-images run text bands transmitting the daily stage of this unproductive siphoning process. Less and less money is left to those who brought about the creation of real socially beneficial value. After dreaming thousands of years of the liberation from work and toil, people have now suddenly to insist on the op-

portunity of working, to turn the Earth into waste once again in order to safeguard their right of existence.²

Undeterred, 'scientists' invented all sorts of zeitgeist theories to support this process of 'unproductive siphoning', with the argument that it was necessary to maintain the required liquidity and to keep the wheels of the economy churning. Only by maintaining permanent economic growth, so the mantra goes, can environmental problems be resolved, and unemployment and poverty be overcome. Only if the rich ('the strong ones', as Chancellor Merkel said in her government declaration) get enough would there be a share left for the poor ('the weak ones'). However, it is and always was precisely the opposite: as the annual social product is limited and finite, the less goes to the poor the more is flowing to the rich. Of course, the destruction of the environment cannot be overcome through growth; on the contrary, it is accelerated. Middle-term economic growth and unemployment have always risen in sync and parallel since 1965 instead of cancelling each other out.³ Mega wealth, poverty, social inequality, and environmental destruction all have the same cause: **unproductive money expansion.**

This perversion of economy and industrialisation was not without consequences. Currently we witness how this capitalism is thrown into the deepest crisis in its history through 'unproductive money expansion', the zeitgeist and vital lies of the rich. It is a self-inflicted crisis of which Man has not yet grasped the entire scale or significance: if he does not take action Man will be facing a rise in global temperature of 5°C, more than over the last 15,000 years, thus the climate researchers from Potsdam. The warm winter of 2007 will become the norm from 2020 on at the latest. Already the rise up to date of only 0.7°C caused extreme droughts, floods and hurricanes, not only in the Sahelzone and in Bangladesh but also in Germany where the winter storms have been most costly. Hurricane 'Kyrill' in January 2007 alone caused damages to the tune of seven billion Euros. The snow debacle in November 2005 paralysed the electricity supply of half of Münsterland (region of the FRG) for five

days, causing millions of damage particularly in those high-tech enterprises that are most dependent on electricity. However, all these catastrophes of today are only the consequence of the comparatively minor sins of the sixties. Imagine the consequences in 40 years' time of the current misdemeanours in light of the targeted 2°C or even of the threatened 5°C increase of temperature! After capitalism has paraded nature over the last 200 years it is now nature's turn to parade capitalism.

With financial securities against the catastrophe

Even more sensational than climate change itself is the way capitalism tries to tackle it. This is indeed a show of the madhouse, likely to occupy generations of bemused historians. For a long time politicians have been unable to exercise any form of control. They have descended to the role of stooges of the economy, utterly incapable to fend off any sort of catastrophe. Consequently politicians are crawling to tackle the crisis with capitalism's very own weapons. Capitalism, however, is only capable of mastering crises if money can be made in the process, that's to say by mobilising 'unproductive money expansion'. How is it possible to resolve crises by means of 'unproductive money expansion'? **This question gave rise to the most absurd constructs of present times, a recreation of the trade in indulgences: so-called 'carbon trading'**. Where is it located? Of course, in the temples of capitalism, in the stock exchanges. There experts have introduced so-called 'emission certificates'. These seriously provide for 'emission rights', a 'market for emission rights' and a 'surplus supply of emission rights'. Even better would be an 'open global market of emission rights' or 'comparative advantage in emissions'. Here language is not only treacherous but also, for once, truthful. For, as we know, capitalism pollutes everything it touches, the air, the landscape, the nights, the rivers, the lakes, the seas, the deep sea, the coral reefs, the cosmos, money, food, the tele-screens, and the brains of our children. This pollution confronts us generally in the guise of cleanliness, purity, and success, or simply as a 'right'. Referring to our glaring but deserted tinsel cities at nighttime, astronomers speak of

'light pollution'. Satellite pictures demonstrate this most impressively.

Also we are confronted with yet another basic capitalist pattern: the bail out from pollution. This is well known too: Ackermann, Hartz, Landowsky.⁴ Bail out of the big boys, blame on the little ones. It is not the billionaires, big land owners, cattle barons, rent sharks, and conglomerates who are guilty but the little fast-food eaters who refuse to buy energy-saving bulbs and leave on their light switches. They are not the perpetrators but always the victims.

Has carbon emission trading actually reduced the production of CO₂? Not a bit. Why not? Because every national government is entitled to hand out certificates as it thinks fit. The consequence is oversupply. Price and demand dwindle to zero. 'Even Monopoly is more transparent than emission trading', noted the Minister for the Environment of the FRG. And why do we have it in the first place? Mainly to make people believe that the crisis is being overcome by a self-financing *perpetuum mobile* that does not have to be paid for. As the television news *Tagesschau* proclaimed in all seriousness: 'the costs of retrieving the electro-waste will be borne by the industry'.

However, nothing is born by the industry. Via prices everything without exception to the last cent is passed on to the people, more precisely: to the majority of dependent employees, who are not able anymore to write invoices but still have to pay them, not only the invoices for the mistakes of others but, at the same time, also for the mistakes of the shareholders and those 'unproductive multipliers of money'. The eternal capitalist variant of the 'causation principle', the principle that the person who causes the damage must bear the cost: those at the bottom create the wealth and pay, while those at the top make the mistakes and cash in. Over precious and lost decades they have ignored all warnings and derided the findings of critical scientists. A chancellor of the FRG has, after his heroic battle against the floods of the Oder, clad in his Wellington boots, in-

augurated the same day a new factory destined for environmental damage: Porsche Cayenne. The Stern Report and the UN Climate Accounts estimate the impending climate costs to be higher than those of the two world wars together. As always, we will grudgingly be paying while the war profiteers will laugh all the way home.

Making money through waste instead of restraint

As it supports only those economic processes, which bring in financial gain, 'unproductive money expansion' is fundamentally at odds with any form of saving. Saving does not make profits nor does it create employment. This makes for an economy of 'conspicuous consumption', of wear and tear, of waste, and of destruction, which Friedrich August von Hayek in all honesty proclaimed to be 'creative'. Thus we get the opposite of saving. The nature of saving resources has not been properly grasped at all: when a nuclear power station is built, then taken out of use and finally dismantled, billions have gone to waste, but the demand for energy is exactly the same as before. Had these billions instead been invested in energy saving measures, the demand for energy would have disappeared for good, it would never crop up again. But this option is less lucrative and adds less to employment.

Example construction: there is more money to be made with insulating exterior walls than avoiding them. Non-existing exterior walls do not need insulation. Avoidable exterior walls, for instance, are gaps between buildings. Each gap wastes through the exterior walls for each floor the heat equivalent of an entire flat. In Dortmund North, for instance, 70 building gaps were recorded per square kilometre, most of them five stories high. Instead of filling them, modern architecture follows the mantra of 'detached housing' and designs ever more building gaps on the urban fringe, one for every detached property. Whereas a terraced house has only three exterior surfaces a detached house has five, 67 per cent more. What for?⁵

Example Deutsche Bahn: The myopic business and investment outlook of Deutsche Bahn is leading to a destruction of lines, capacities, and staffing. These measures will have to be reversed one day, with great expenses, under the pressure of rising petrol prices and the costs of individual transport, as is currently happening with the senseless canalisation of rivers, the building of mass estates and tower blocks in the 1960s.

Example solar energy production: Even here where ecology is the prime focus, we encounter waste for the sake of profit. It would be imperative in the first instance to use all roofs and south-facing walls as cost-free scaffolds for the purpose of harvesting solar energy. Thus production of energy would be decentralised, brought closer to users and would thus avoid loss through transport. It would also improve the aesthetic of our post-war architecture. Instead, new mega-constructions with costly support structures are slapped over open stretches of yet unspoilt countryside.⁶

Example biogas production: instead of processing in the first place the millions of tons of waste already available in agriculture and forestry, all refuse deriving from clearing and shredding (e.g. along the motorways), all rape stalks and grain straw as well as potato plant leaves, these millions of tons are left to rot, and so-called renewable resources are planted on specially marked out green-field sites as competing food stuff.

All this wasting is not by omission. It is politically and economically sanctioned. More than anything, it is serving 'unproductive money expansion', and through its machination, the accumulation of private money assets. As this wealth is to over 50 per cent in the hands of the richest 10 per cent, all waste amounts to one thing: serving the rich.

The business of the whitewashers

All this is permanently justified and swept under the carpet with the most abstruse arguments. Whole cohorts of zeitgeist-matadors, compliant scientists and other whitewashers

Subject articles

prance about with their books and on tele-screens. According to the Greenpeace Black Book, 32 politicians in office and 28 retired ones are in the service of energy companies. A ferocious propaganda marathon is unleashed: climate conferences, empty commitments, appeals, stickers, EU contracts without sanctions, etc. – the great climate hysteria! ‘Help...the Earth is melting’, carries a headline of ‘Der Spiegel’.⁷ George Bush had gathered once again the ‘willing ones’ around him, this time the world’s biggest polluters. An actual ‘executive director’ of the UN was pleased to announce that economic growth had eventually overtaken the production of climate pollutants.⁸ Meanwhile, the industrial nations are gloating the North would benefit from climate change: palm trees along the North Sea and rhinos in the Thames – the Tertiary all over again. Anyway, he mused, it would only hit the already poor ones in the South. Other soothsayers want to make us believe the catastrophe could be averted through energy-efficient bulbs and time switches.⁹ This is an attempt to divert attention from their own much more severe misdemeanours:

- from the wars of the West, before the beginning of which already greedy reconstruction conferences are held,
- from the waste of lighting energy in our nocturnal glitter towns whose mayors organise ‘light festivals’ and ‘light competitions’ with ‘light installations’ and floppy-hat wearing ‘light artists’ for the purpose of regenerating their city centres; the flip side of this glitter is the palls of smoke emitted by the power stations,
- from the energy-wasting northern and all-round facades of glass towers of company headquarters, which look the same wherever you go - in Montreal wastefully heated and in Sao Paulo wastefully cooled,
- from the empty spaces of public buildings, among them our universities which, due to vacation, holidays, inefficient use of space, stand empty for 85 per cent of the year but have to be heated and kept clean 100 per cent of the time,

- from millions of tons of futile printed promotion material dropped into our letter boxes, etc.

How many light switches will have to be turned off for how long to compensate for the voyage of a single US aircraft carrier to Iraq and the deployment of its fighter planes?

Sundry conservative philosophers will make us believe Nature cannot be destroyed. The product of destruction, too, would be Nature and be intended by Nature, for the culprit, Man, is part of Nature too.¹⁰ To avoid such sophisms and gratuitous licence it would be better to speak not of 'nature' but of 'evolution'. Billions of lifeless celestial bodies are Nature too.

Our planet, however, is so very precious because, with only a tick of a cosmic second, it has reached a very high standard of evolution. Progress can be measured but evolution is always disentanglement, always the building of new, previously never existing potentials. This can only be achieved by consuming less than is being reproduced. Its opposite is an irreversible mixture, a regression to lost potentials, entropy, refuse, litter. It is achieved by continuously consuming more than can be reproduced. This principle applies equally and summarily to the evolution of Nature as to the evolution of Culture. As long as 'unproductive money expansion' carries on without check, there will be neither restraint nor justice, never mind sustainability. Coal and oil can only be consumed but never be replenished. So-called 'more efficient' coal-based power stations are only extending the consumption for a little while, and they will not be operating before 2020. All lasting solutions require the use of the Sun, be it active or passive, direct or indirect (e.g. through bio-gas).

Solar energy is inexhaustible, soft, decentralised, and not primarily business inclined. It does not therefore per se favour the 'unproductive money expansion'. Solar energy is the door to the world of post-capitalism.

If the exit from fossil energies tied to big business and 'unproductive money expansion' fails, then it would be perfectly possible, as happened so frequently in history, of a sensible beginning to turn into something calamitous, namely the early success of industrialisation into disaster. Everything would pass in accordance with the time-honoured pattern: ascent, flowering, descent. Finally plutocrats would reign over combustion waste. For the first time in history the demise of a system could bring down the entire globe with it. We may then be faced with the choice of what to consign to the waste bin: Globe or Capitalism? How would we vote then?

Translation: Lutz Luithlen

Sources and comments:

1. The context of these issues is to be found in the publications Nr. 30*, 32*, 46*, 48* of the time 1990-95.
2. See thereto Guenther Moewes: "Über Wertschöpfung und Abschöpfung" in *Humanwirtschaft* 02/2007.
3. See thereto the contributions of the author in *Humanwirtschaft* 04/2006 and 06/2006.
4. Ackermann (Chief Executive of Deutsche Bank), Hartz (Director of the VW Personnel Board) and Landowsky (Berlin politician) were all defendants in well-publicised German corruption trials which ended in surprising acquittals.
5. See also publ. Nr. 46*, 48*, 49* (1995) and 77* (1999).
6. See also publ. Nr. 77* (1999) and 87*, 95* (2006).
7. *Der Spiegel*, Nr. 19/2007.
8. Achim Steiner: "Die Welt ist gar nicht so schlecht", in *Die Zeit*, 31.05.2007.
9. Among others the Australian Minister President.
10. See thereto in detail publ. Nr. 29* (1990).
See: www.quenthermoewes.de

EMPLOYMENT ISSUES ARISING FROM CLIMATE CHANGE POLICY AND THE ROLE OF ELECTRICAL CONTRACTORS ASSOCIATION AND TRADE UNIONS

Peter Glynn

Introduction

As public policy and public opinion increase their demands for rapid and drastic cuts to GHG emissions, so does the focus on buildings as the inefficient and often wasteful consumers of energy increase. That said, buildings also provide a solution with opportunities for governments to achieve significant emission reductions in a short timeframe. In this regard, electrical contractors can bring to clients, builders and regulators the sophisticated technologies to deliver the mandated building energy performance.

The electrical contracting sector is already highly regulated through worker certification and accreditations, exacting consumer safety standards, technical installation standards, product approvals and compliance audits. As buildings become the focus for climate policy, regulation will increasingly focus on the electrical and data installations and most if not all of these performance requirements will change rapidly and often as climate change policy and regulation evolves.

Electrical contractors' associations and electrical trade unions play an essential role in the management of the affairs of the industry, representing the interests of the sector in the development of public policy and the supporting technical standards and regulation. In turn, they ensure the contractors and installation technicians are up to date with those changes, that the infrastructure exists to provide the training necessary to upgrade the skills, and that the future labour pool can meet requirements for technicians with the skills and in the number required.

Transitioning to green electrical contracting

Immediate concerns are of course that the move to a low carbon economy could lead to job losses and that existing workers will not be suitable for the new green electrical contractor. Available research shows that the labour market across all of industry is already changing, that jobs will be created, employment will be substituted (move from one industry to another), and existing jobs will transform into 'green jobs'. It also acknowledges that jobs will be eliminated (Worldwatch 2008). In respect of the construction sector, the new 'green jobs' are foreseen as being performed by those coming from the industry and retrained, a view supported in other research (Eurofound 2011; Pauwels et al. 2011).

Research also shows that skills gaps and shortages may be a binding constraint and that 'the majority of architects and engineers worldwide are unaware of the materials, design and construction techniques available for energy efficient buildings and are therefore unable to put them into use in their projects' (UNEP 2008, p. 19). While one suspects that reference is probably now dated, current OECD (2011) studies find that skill shortages are already a concern, a problem attributed to an underestimation of growth in the small and medium enterprise sectors, national skills structures that do not meet demand and the low reputation of some occupations (Strietska-Ilina et al. 2011).

Labour market authorities (ILO, Friedl-Schafferhans,) believe the green construction team will add occupational profiles and new occupations that will require new sources of labour to supplement the existing workforce. The ILO (2011) sees the emergence of additional functions such as assurance, financing, research, education and policymaking (p.3). The green electrical technician will require skills in customer orientation, ability to communicate and decide, to consult and sell, planning competencies, a high level of independence and global thinking (Friedl-Schafferhans 2011). The existing labour pool is not deep enough to satisfy these requirements, and new

sources of labour must be found if the demand is to be met (ILO 2011).

A labour market plan is a key to the smooth, effective and safe transition to a low carbon economy. It is not merely the single dimension of labour and skill shortages, but also the restructuring of occupational profiles and the emergence of new occupations in the delivery of a low carbon electrical installation. To this must be added the new products and regulations, particular sensitivity of the unknown and the requirement for people to only do work for which they have been properly trained.

Climate change, social dialogue and the social partners

In electrical contracting the employers' organisations and electrical trade unions represent the interests of their member businesses and workers in labour relations, occupational and technical regulation, skills development and other industry specific matters. In most EU member states, the social partners are involved with low carbon economy issues from the stage of policy formulation, where they express their positions on policy proposals either through institutional tripartite bodies dealing with sustainable development or by direct lobbying on draft legislation (European Commission 2011). The European Commission views social partners as playing an important role in the economy as a whole and the labour market in particular. In respect of climate change it looks to them to create consensus for policies across their sector of industry, expressing the view that 'a shared analysis of employment opportunities and challenges by social partners can contribute greatly to a well managed and socially just transition' (European Commission 2011, p.153).

The trade union movement has expressed the intension to negotiate climate change through collective bargaining and recently unions in the UK sought the right for time off during working hours for workers to promote sustainable workplace practices, to receive training and the right to inspect workplaces for energy efficiency. If agreed, this would require change at least to collective agreements and possibly the broader prevail-

ing labour standards (Eurofound 2011). At present collective bargaining on issues related to climate change is unusual in EU member states, but social dialogue¹ at company level on issues such as energy efficiency and emission cuts is slowly spreading (European Commission 2011). The International Organisation of Employers advocates that climate change may be a matter for social dialogue but not collective bargaining (IOE 2009). It argues that, as an issue for labour and management, climate change does not add a condition to existing labour agreements, that issues relevant to the business arising from climate change should be addressed through the normal consultation process.

Climate change, regulation and electrical contracting

The European Commission (EC) current policy framework is articulated in its Climate and Energy Package (the Package) which includes the 20:20:20 targets to be achieved by 2020:

- reduction in emissions of 20% below 1990 levels
- 20% of energy is to come from renewable sources (wind, solar, wave)
- 20% reduction in primary energy consumption² to come from energy efficiency measures.

The Package is supported by a suite of complementary legislation including the EU Emissions Trading Scheme, binding renewable energy targets and carbon capture and storage (Europa 2010). The Energy Performance of Buildings Directive 2010/31/EU and the Energy Efficiency Action Plan provide the sectoral and energy performance requirements for a wide range of products, buildings and services with complementary directives and regulations (European Commission 2006).

EC policy embraces the energy efficient low carbon building requirements for intelligent control systems connected to smart appliances, the integration of renewable energy sources, and sustainable energy supply. It has initiated work on a range of regulatory instruments to support this outcome including the development of standards for renewable energy sources and their integration; monitoring the data extracted from the in-

stallations performance; and electrical safety of the new low carbon energy efficient electrical installation (Schellekens 2010). The electrical contacting associations and union are active in this process through their regular contacts with the electrical value chain and other partners, through the active participation in European funded projects, and participation in EU working groups.

Electrical safety and safe work practices are a fundamental aspect of regulation over electrical contractors work and project planning. In 2010 the EC committed to a study to assess how to improve the safety of electrical installations while increasing their energy efficiency and enabling safe integration of renewable energy sources (Schellekens 2010). This was a sound decision in light of the experience earlier in the year from the Australian governments home insulation climate initiative. The Australian Home Insulation Programme was designed to future-proof domestic residences against rising energy requirements, and to provide employment for low skilled labour that were to receive training specific to this set of tasks. The electrical contractors association and union had been concerned at the potential electrical hazards and advocated a review of the relevant technical and safety standards for the programme, related to down lights and the safe installation of insulation near to them. The government failed to heed the advice and four installers were fatally electrocuted. The programme was withdrawn amidst health and safety concerns (including numerous house fires), poor workmanship and sub standard products (Combet 2010).

In conclusion

Electrical contracting is at the forefront of technology in the provision of energy efficient and low carbon building stock. The challenge is for all links in the construction supply chain - including public policy, regulation, technology, builders and specialist contractors - to meet energy and emission targets.

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1. Social dialogue is a concept embedded in EU legislation. Social dialogue is all types of formal dialogue involving discussions consultations negotiations and joint actions undertaken by employer and worker representatives on conditions in the workplace (Eurofound 2011).
 2. OECD Definition: Primary energy consumption refers to the direct use at the source, or supply to users without transformation, of crude energy, that is, energy that has not been subjected to any conversion or transformation process (United Nations 2001).

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A TALE OF TWO POWER PLANTS

Labour Mobility and the Deregulation of Industrial Relations at the Olkiluoto 3, Finland, and Eemshaven, Netherlands, Construction Sites

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Labour mobility in the EU is bringing about fundamental changes to national industrial relation systems. National industrial relations actors are no longer able to effectively regulate working conditions in construction contracting chains. Main contractors, while maintaining conditions for their own employees, are aggressively pursuing policies which seek to isolate their sites from effective control by unions and labour inspection agencies, in order to save on labour costs. This is done through extensive use of foreign labour, usually from lower wage countries within the EU, and often 'posted' via their employer, whether that be a subcontractor or a work agency. The result is multi-national and multi-lingual worksites, widespread labour standards violations, and deliberate policies to confound and undermine national worker representation arrangements. Principles not so long ago deemed fundamental, such as equal work for equal pay, have become archaic.

We examine some of the employer strategies behind these developments, and so far unsuccessful union strategies to counter them, at two large construction sites – the infamous Olkiluoto 3 nuclear power plant site in Eurajoki, Finland, and equally high-profile gas-fired powered powerplant in Eemshaven, Netherlands¹. Both are large sites in remote, economically depressed and lightly populated areas. Olkiluoto 3 is near

Subject articles

Rauma, on the west coast of Finland, about four hours from Helsinki, while Eemshaven lies on the north-east coast of the Netherlands, near Delfzijl, about three hours from Amsterdam. In many respect, these projects exist in a self-contained, isolated, international social space, set apart from the regions where they are physically located.

This presents a so far unresolved challenge for trade unions, in that the workers are difficult to organize and represent. In general, migrant workers can be difficult to organize. Even more than individual migrants, posted workers are especially mobile. Furthermore, posted workers' right to equal treatment and to collective representation is under challenge, both legally under EU law, and in practice. At Olkiluoto 3, the Finnish unions initially attempted to assert authority over industrial relations on the site using secondary industrial action, which in the Finnish construction industry is usually a successful tactic. When that failed because of a lack of leverage, the union assumed a relatively passive role, even to the extent of attempting to sweep under the rug complaints from Polish workers about bad treatment. However currently, when the construction has entered into the installation phase, and the site employs more skilled segments of labour, the Finnish unions involved in the construction seem to have assumed a more assertive role, employing again the secondary boycott tactics. At Eemshaven, in contrast, the Dutch unions set out from the start to engage with the posted workers. Although organizing industrial action seems unrealistic, the Dutch unions have systematically campaigned among the posted and native workforces against poor wages, discrimination and unsafe conditions.

This research is set in the context of two larger research projects. The first was Transnational Unionism and Democracy in Global Governance, which took place at the University of Helsinki from 2005-2008. The second is Transnational Work and the Evolution of Sovereignty, funded by the European Research Council, which is ongoing at the University of Groning-

en, Netherlands. A more developed analysis of the Olkiluoto 3 case can be found in *Work, Employment and Society* from June, 2011.

Olkiluoto 3

Olkiluoto 3, when complete, will be the most powerful nuclear reactor in the world and the first completed in Europe in more than a decade. The project began in 2004, and is due to finish in 2013, far behind the originally scheduled date of 2009, having been plagued by mismanagement and scandals. Olkiluoto 3 construction involved over 1500 contractors from 28 different countries in March 2008, when the reactor building was most intensive. In August 2008, about a third of the 3400 workers were Finnish, with the rest coming from over fifty different countries, the largest foreign groups being French, German, and Polish. The main contractor responsibilities were divided between TVO and the 'consortium' of AREVA, a mostly French-state owned atomic energy company, and Siemens, a German technology conglomerate.

Workers involved in reactor building at Olkiluoto 3 mostly fell under the jurisdiction of the Finnish Construction Workers' Union (Rakennusliitto), or the Metalworkers' Union (Metallityöväenliitto), with the former the more important. In the current later stages of construction, the Electrical Workers union (Sähköliitto) has also begun to play an important role. Union membership density in construction nationally is at about 70 per cent, although at Olkiluoto 3, because of the centrality of foreign firms, it has been closer to 30 per cent or lower. As at most construction sites in Finland, at Olkiluoto 3, the unions established a shop steward network, but at Olkiluoto the shop stewards were exclusively Finnish and for the most part did not develop close relations with the posted workforce. Finnish union officials and shop stewards had great difficulty in recruiting posted workers, although some did join.

Subject articles

There was a case, however, at the OL3 site that highlighted the willingness of the Polish workers to take industrial action on their own behalf, and the union's inability to deal with such a situation. In August 2007, Polish Rakennusliitto members employed by the Atlanco Rimec Group complained to the union of collective agreement and labour code violations. Key among the complaints was a large unexplained wage deduction for social fees. Atlanco Rimec is an Ireland-based transnational work agency, which supplies skilled and unskilled workers from around Europe to industrial and construction undertakings.

When the shop stewards and Rakennusliitto regional office took no action, the workers appealed to the Warsaw office of the European Migrant Workers Union (EMWU), a transnational subsidiary organization to the German union IG Bau. The EMWU contacted the Rakennusliitto and offered to assist in organizing the Olkiluoto construction site, by for example supplying Polish-speaking organizers (which the Rakennusliitto did not have – Polish translation was done via a national office secretary who happened to speak Polish). The Rakennusliitto rejected this proposal.

The Polish workers eventually started industrial action on their own account, embarrassing the Rakennusliitto into declaring a strike threat of its own. The Rakennusliitto negotiated; many of the Polish workers felt they did not have enough input into these negotiations. It emerged then that the workers were employed via an Atlanco Rimec subsidiary in Cyprus, although without their knowledge, and the unexplained deduction was social fees to the government of Cyprus. Since the deductions were apparently legal, a strike might have been judged illegal. The Rakennusliitto therefore cancelled the strike warning. Many of the Polish workers were dissatisfied, and cancelled their union memberships.

The industrial relations situation at the site may have changed due to a strategy change of the unions. While the attempts of Rakennusliitto alone to defend the Poles were feeble in 2007-08 (the construction of reactor building proper), now (in the installation phase) an 'alliance' between Rakennusliitto, Metalliliitto, the Sähköliitto and Trade Union Pro seems to have a bit more successful approach in recruiting and representing foreign members. In 2011, the Sähköliitto brought a legal action against Elektrobudowa SA, a Polish contractor, for unpaid wages to 115 Polish workers on the site worth of 3 million euro. The Polish contractor dismissed 31 Polish workers, most of who were Sähköliitto members. In response, the 'alliance' of the four unions has declared a boycott on the Olkiluoto site, starting in the beginning of December, if the wages and the dismissal are not settled with the unions. In other words, the tones at the site in the end of 2011 have started to reflect a more 'normal' discourse in such a situation in Finland.

Eemshaven

The Eemshaven, an industrial area in the northern part of the Netherlands, has seen a significant increase in construction activity over the last couple of years. However, the companies that nowadays seem to put a defining signature on the Eemshaven are two energy corporations that are building new energy centrals there. The German owned RWE is building a coal fired power plant using its own engineering team and employing 70 direct contractors that subsequently have several subcontractors each themselves. Nuon, a formerly Dutch company, now owned by the Swedish Vattenfall, is constructing a multi-fuel power plant and has selected the Japanese Mitsubishi to supply and build the power plant. Although similar issues arise at other sites in the region, this section will focus on the Nuon site. In summer 2011, at least 1700 people were working at the Nuon site and the official language of communication was English. There are no accurate numbers available, but the majority of workers employed on both these sites are non-Dutch and originate from at least 15 coun-

Subject articles

tries, from amongst others Poland, Germany, Japan, Turkey, Belgium, Italy, Portugal, France, Romania, Slovenia and Lithuania.

FNV Bouw (construction union) and FNV Bondgenoten (representing amongst others metalworkers) joined forces for the occasion to establish FNV Eemshaven to reach the workers on both construction sites. For this article, the FNV's approach towards the Nuon site is further examined, but it must be noted that the union's approach towards the RWE site is very similar. We have been making observing union organizing strategies in the Eemshaven since January 2011.

The FNV did not have much experience organizing large construction projects such as the two in the Eemshaven. The main problem for the union was that they did not have active members working on the site, through which to organize and mobilize the (migrant) workers. This is mainly because of the large percentage of foreign workers, making traditional organizing via the existing membership base impossible. Even more than the Finnish unions at Olkiluoto, the Dutch unions have been denied effective site access, and have lacked any sort of shop-floor activist structure. The FNV thus needed to develop different strategies to effectively reach the predominantly foreign workforce.

In the first half year of 2011 the FNV made housing site visits. Union representatives would visit the workers' accommodation to ask questions about their working conditions in the Eemshaven. Often they handed out flyers in the workers' languages informing them about legal minimum wages in the Netherlands. It proved difficult to make stable contacts this way because the workers did not seem to trust the union enough to talk with them and share information. From the second half of 2011 onwards, the FNV changed its approach, and started hosting regular office hours either at the workers' accommodation or at the construction sites. Most workers employed on the Nuon site are accommodat-

ed in large-scale container parks, some of which host up to 1200 people. These office hours are easily accessible for the migrant workers as there are unionists present that can offer information and help in the workers' languages. This way, the union hopes to establish more trusting and stable relations with the migrants and to overcome some of the previously encountered barriers. For example, migrant workers are becoming less reluctant to show their pay slips to the union, when they suspect something is not in order. The information gathered this way leads the FNV to conclude that pipe-fitters employed by the same consortium of firms on the Nuon site were paid differently on the basis of their nationality: Dutch pipe-fitter Jan earns € 13.12 per hour, Portuguese pipe-fitter José earns € 10.10 per hour and Polish pipe-fitter Janek earns only € 9.54. This the FNV used in their 'Equal pay for equal work' campaign on the world day for Decent Work; the union produced a flyer and flew a banner over the site, and encouraged workers to send their pay slips in to help the union in its fight for equal pay.

The main barrier the union has to overcome is the fear. Posted workers at the Eemshaven sites fear retaliation from their employer, commonly in the form of dismissals, if they complain, and their fears appear to be well founded. One example of this can be found in the same Atlanco Rimec group active at Olkiluoto. Rimec also supplies cheap labour at the Nuon site, where there have also been complaints of violations of minimum employment conditions. When workers on Rimec's payroll complained of this to their supervisors (not at Rimec, which just supplies the workers, but at the contractor supervising their work), they were told that if their complaints were found to be justified, they would be fired. This illustrates that the incentive among migrant workers to claim their rights is low, as taking action themselves does not in the main improve their personal situation.

The FNV's approach to the Eemshaven is still in development, and the ultimate outcome is not yet clear. The FNV has

Subject articles

adopted a very pro-active approach in trying to represent the migrant workers, which is a deviation from its traditional organizing approach. However, whether this pro-active organizing will prove to be successful to create lasting changes in employment conditions of migrant workers, is something that needs to be seen. The union has, for example, as of yet not been able to mobilize these workers on a larger scale.

Conclusions

Although both cases are exceptional in the sense of involving large workforces in remote regions, in terms of trends in recruitment, management and treatment of workers they are exemplary rather than exceptional. These sites make apparent that there is a pan-European labour market in construction, segmented by nationality, over which trade unions and national labour regulatory have only weak and intermittent control. Transnational operators such as Atlanco Rimec freely flout national laws, and pay levels are openly discriminatory, based on national origin.

Trade unions so far have no effective response. While the Finnish Rakennusliitto acting alone in 2007-08 was clearly handicapped by an ethnocentric orientation in its reluctance to engage with and represent Polish workers, the Dutch unions started from the supposition that they should go straight to the posted workers to gain their trust and support. Even so, the Dutch unions have had a very difficult time overcoming mistrust and the very plausible prospect of employer retaliation.

Both the Dutch and Finnish unions are currently in a phase of enhancing their tactics. In contrast to the other Finnish unions and the FNV, the Finnish Electricians' Union seem to be having success finally at Olkiluoto 3. It is, however, operating in a more highly skilled segment, and with the benefit of experience from the other unions' failures. It seems that the union alliance (the Rakennusliitto, Metalliliitto, Sähköliitto and Trade Union Pro) is confident it can make the Ra-

kennusliitto's boycott tactics work. Given the broader participation of the other unions in the boycott, the unions may be able to gain better leverage to assert their demands.

In the Eemshaven the FNV now seems to be making leeway with establishing more structural, trusting and stable relations with the migrant workforce at the sites. However, the union has not actually been able to improve conditions for the workers yet. If they can do this, they hope it will inspire more trust from the workforce, and gain them more leverage for their claims.

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WHAT IS THE IMPACT OF 'GREENING' ON THE CONSTRUCTION SOCIAL DIALOGUE?

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The greening of European economies is often perceived as the new panacea for prosperity and progress. But if at interprofessional level greening is seen often only as a positive development, it is interesting what happens at the sectoral social dialogue level. This analysis is based on the research undertaken within the framework of the European comparative project, WALQING (www.walqing.eu). **WALQING** is a project in the EU's 7th Framework Programme, involving research institutes and universities in 11 countries. **WALQING** explores the linkages between 'new jobs', conditions of work and employment in these jobs, and the outcomes for employees' quality of work and life. It connects micro- and macro-levels of analysis and, based on this evidence, identifies both critical configurations and examples of good-practice. The project consists of three main parts (or 'pillars'): quantitative, qualitative and institutional. The first part focuses on the analysis of EU level data; the second focuses on the analysis of stakeholders strate-

Subject articles

gies; and the third focuses on the cases of organisations and individuals.

One of the sectors covered by WALQING is construction. The construction sector is the biggest industrial employer in Europe (FIEC, 2011), contributing to almost 10% of the GDP of the EU. After a period of continuous growth, construction was badly hit during the financial and economic crisis. It also contributes to 42% of EU final energy consumption and to 35% of all greenhouse gas emissions. The sector is challenged by the new policies aimed at combating climate change. Green construction activity concerns new buildings, but also the renovation of existing buildings (Campogrande, 2011). The need for energy savings is not new in some European countries, but during the last few years, environmental regulations and policies have placed a strong emphasis on green construction. Energy saving buildings and the rehabilitation of existing buildings represent a growing subsector in construction activities. These perspectives are important because in some European countries only the construction of energy efficient buildings will be allowed in the future. All EU member states will be obliged to adhere to environmental E-standards that will gradually become stricter.

But to what extent does the social dialogue in the sector address greening? And how? The following sections examine the main features of the social partnerships in four countries and focus on the practices related to greening in order to conclude on the industrial relations issues.

Social Dialogue in construction in four countries

The social dialogue in the construction sector has traditionally been well developed. The sectoral social dialogue committee at EU level was set up in 1999 by the European Federation of Building and Woodworkers (EFBWW) and the European Construction Industry Federation (FIEC). FIEC and EFBWW have joint initiatives and projects in different fields (H&S, trainings, posting of workers, migration, nanotechnologies, etc.).

In Belgium on the employers' side there are two major organisations, Bouwunie (i.e., defender of the interests of SMEs within the construction sector) and Confederatie Bouw (i.e. representing mainly large enterprises). The trade unions are ACV – Bouw, Industrie en Energie (i.e., a Christian trade union) and ABVV Centrale Antwerpen – Construction (i.e., a socialist trade union). The social dialogue within the construction sector was evaluated as 'good' (Pauwels, op Den Kamp & Ramioul, 2011). The period of negotiating a collective agreement can take a long time since the sectoral level is the most important for this sector. In Belgium, construction companies are typically SME. The few larger companies have a preference for negotiating wages at the sectoral level in order to enforce standard pay conditions and prevent smaller competitors without local trade union representatives from being tempted to underpay their staff or make use of undeclared work. Sectoral level collective agreements are well respected on the whole, even by SMEs. Enterprise level collective agreements exist within the sector, but are mostly limited to the concrete implementation of the sector collective agreement in one of the larger construction companies.

Social partner cooperation in Norway is strong in general, and this is also the case in construction. Major players include the Norwegian Federation of Trade Unions (LO) and the Confederation of Norwegian Business and Industry (NHO), both within the private sector through their respective members, and the United Federation of Trade Unions (No: Fellesforbundet) and Norwegian Building Industries which again is part of The Confederation of Norwegian Business and Industry (NHO). The construction industry has a low degree of unionisation in general; however in larger companies the situation is different, with some enterprises having a very high degree of unionisation. Collective bargaining with negotiation on general agreements is conducted bi-annually, with adjustments every year between. Four important areas of cooperation are relevant for the construction industry: occupational health and safety (including absenteeism); education, competence and up skilling; productivity and innovation, and; junk enterprises and social dumping.

Subject articles

In Hungary there are two trade union federations in the construction sector, Építő, Fa- és Építőanyagipari Dolgozók Szakszervezeteinek Szövetsége (the Federation of Building, Wood and Material Workers' Unions, ÉFÉDOSZSZ) and Építőipari és Társult Szakszervezetek Országos Szövetsége (the National Association of Construction Workers' Unions and Other Affiliated Unions, ÉTSZOSZ). EFÉDOSZSZ is member of Magyar Szakszervezetek Országos Szövetsége (Hungarian Federation of Trade Unions, MSZOSZ). At international level, EFÉDOSZSZ is member of the European Federation of Building and Woodworkers (EFBWW). Following the formal communist unions in construction, ÉFÉDOSZSZ, had more than 100.000 members in the early 1990s. In 2011, the union estimated this had fallen to less than 5000 members in less than 100 companies altogether. Most of its members are employed in construction material producing companies. In construction itself there are hardly any employee union members. ÉTSZOSZ used to have dynamic development but its membership shrank during the last year (note that before the crisis it had about 4000 employees). The employers' organisation is the National Federation of Hungarian Contractors (Építőipari Vállalkozók Országos Szövetsége, ÉVOSZ). It represents about 500 member companies, of mostly large and medium size. The organisation claims that its members contribute to 66% of the output of the industry, employing around 10.000 employees. A sectoral agreement was concluded in 2006 and extended by the Minister of Labour across the whole construction sector. It was assessed by the social partners as having low regulatory power: the most important feature of the collective agreement was to introduce a compulsory wage tariff but practically the same levels were negotiated within the national minimum wage agreement which was concluded in the meantime. Collective agreements at workplace level have recently been concluded in a small number of bigger firms only, where unions are still present. In most of the industry, collective bargaining is not a reality, and collective agreements do not have a real impact on terms and condition of employment.

In Bulgaria, social dialogue developments are similar to those in Hungary. The main actors in collective bargaining in the construction sector are the Bulgarian Construction Chamber (BCC), the 'Construction, Industry and Water Supply Federation' (FCIW), PODKREPA, and the Federation of Independent Construction Trade Unions (FICTU), CITUB. These three actors have developed and signed the current collective labour agreement at sectoral level. The current CLA came into force on the 4th of January 2011, with a duration of 2 years. FCIW defined recent CLAs as balanced in accordance with the interests of both the trade unions and employers:

'It is a compromise from both parties. I think it is not a bad agreement, compared to others I've seen. Certainly more could be required, but now it is quite difficult in accordance with certain circumstances that are beyond our control' (Unions, Bulgaria).

Collective bargaining in the sector has achieved some results, for example, higher minimum wages in construction, higher social insurance contributions, and longer paid annual leave, but they are only mandatory for the members of the trade unions and the Chamber. Both trade union density and employer representation are relatively low. Many small companies in construction are not members of the BCC. Still there is no comprehensive information about work and life quality of employees in these companies. The question is also to what extent the application and implementation of the CLA provisions is monitored, since the GLI only monitors the compliance with the Labour Code (Peycheva & Kirov, 2011).

Greening

Explicit initiatives and debates over the greening of construction have tended to be concentrated in Northern and Continental Europe.

In Belgium, the respondents from the unions point out that one of the consequences of the growing importance of sustainable construction is the development and usage of new materials. For example, the use of rock wool is traditional in insulation, but new

products are also being developed in this field. The insulation of houses in the near future may be done with a new paper-thin material, which up till now has only been used in airplanes. However, from the start it is not always known how a particular material influences the health situation (e.g. asbestos). According to the union ACV-BIE, the use of new materials and techniques can create major opportunities for sustainable building, but it is important to be aware of possible long term health and safety risks. Since green jobs require implementing new building techniques, questions arise on how to develop the right set of competences or skills to carry out these new jobs. How do new and existing workers need to be trained and educated to incorporate the new skills required? In recent years, Bouwunie, ABVV, and ACV-BIE have noticed a growing demand for education and training in sustainable building techniques. For example, insulation workers have to refine their techniques, learn new techniques and work with new materials. For other occupations going green in the construction industry, the demand for education and training is similar. However, ABVV states that there is, as of yet, no real training available in green work. An example given by ABVV of a particular company working in insulation is striking. Since the E-norm became stricter and stricter, insulation techniques have had to improve constantly. For instance, a trend in construction is the ever thickening of insulation: the insulation needs to be taped in the wall without gaps so that there is no loss of heat. When check-ups have been made, this process has generally been done well. However when such check-ups are not undertaken, the quality of the work may suffer because the standard techniques once used are not sufficient anymore. According to ABVV, workers want to learn, but the Fund for Vocational Training has no training geared towards working in green jobs or working within the field of environment. Existing courses do not meet the needs to re-educate people about the new techniques and new materials either because instructors are not well enough informed on these kinds of developments. The new competences for sustainable building are indispensable not only for those who are high

skilled (e.g., architects, foremen) but also for those less-skilled workers who need the skills to build sustainable. Thus there is a stronger need for more attention to be paid to sustainable building techniques not only in university and engineering education, but also in vocational and further training. However, this strong need for skills and a lack of sufficiently trained workers is typical for the sector.

Indeed, in the Belgian construction industry, the term 'green jobs' is used frequently. According to the employers' organisation, Confederatie Bouw, between 2010 and 2020, it is expected that 20,000 construction employees will have green jobs. In the last decade, attention in the sector has shifted towards ecological concerns and energy efficiency which has led to existing jobs becoming more 'green' and the creation of new 'green' jobs where new competences are required. In 2009, Confederatie Bouw published a report, called 'Building the environment and energy: elements for a green construction economy' which showed that the number of employees within the 'green' construction sector has increased tremendously within the last decade. The prospect for the future is that this increase will continue.

Since green jobs require implementing new building techniques, questions arise on how to develop the right set of competences or skills to carry out these new jobs. How do new and existing workers need to be trained and educated to incorporate the new skills required? In recent years, Bouwunie, ABVV, and ACV-BIE have noticed a growing demand for education and training in sustainable building techniques. For example in Norway, environment and energy are also an issue of growing importance in the construction industry. This is one of four strategic areas for the construction industry, but is still not addressed in a similar way by trade unions. Environment and energy questions in construction can, for the purposes of this discussion, be divided into three (possibly overlapping) areas: environmental issues that constitute health and safety risks for workers and society; waste, reuse and recycling issues and energy issues (Torvatn, 2011).

Subject articles

Much work has been done on all those environmental issues that also constitute OHS risks, like asbestos, polychlorobiphenyls (PCB) and so on. As long as environmental issues coincide with OHS risks, the construction industry has the structures, knowledge and motivation to handle it. On such issues there is also cooperation with trade unions. Waste, reuse and recycling is an area where the construction industry has worked for several years and according to its own investigations, the knowledge and acceptance of this topic has grown in the past few years. While the construction industry has initiated several projects and programs, like the 'Reduction of Energy Usage in old Buildings', the trade unions are invisible in this work.

In contrast to the practices undertaken in the old member states, in the New Member States (NMS), greening is present more in the discourse of actors than in real life. This is because of a lack of public and private funds and a perception of more pressing problems in the built environment and infrastructure. In Bulgaria, there are conferences about passive houses but only a few passive houses have been built in the whole country. Green office and other projects are also rather rare. The greening aspect in construction lies mainly in the domain of the renovation of old buildings and in taking energy efficiency measures. The opinions of interviewees differ somewhat in relation to the qualifications of the workers in insulation. According to the employers' representative, employment in thermal insulation includes mainly low skilled workers because this type of construction work does not require important technological processes and is not so complicated. Highly qualified employees are concentrated mainly in high building construction and in the large construction sites (i.e., non-residential buildings). In construction, work is organised in teams known as 'brigades', with certain specialism and type of activities, where there is a core of highly qualified and trained specialists and few low qualified workers (Peycheva & Kirov, 2011).

Conclusion

The trend towards energy-efficient building is among the main challenges for the sector but, while this is something real in some countries, it seems still to be rather abstract in others. The effects of greening on the quality of work are not universal and, overall, there seems no straightforward link between greening and decent jobs. The results of the WALQING project focused on the construction sector industrial relations allow to distinguish the increasing importance of greening in the discourse. As could be seen, the use of new materials in technologies and the application of the new types of legislation preoccupy social partners in countries such as Belgium, but their real impact on the organisation and on job profiles is limited. Joint institutions providing training still do not invest massively in the development of new skills related to the environmental challenges. At the same time in Central and Eastern Europe greening is still not an important issue in the agenda of social partners, the focus being rather on combating informal practices, collective bargaining and the retention of qualified workers. Cases studies done in the framework of WALQING confirm that the workplace impact on the quality of work is not due directly to greening.

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THE BELGIAN ECO-FRIENDLY CONSTRUCTION SECTOR: DEFINITIONS AND IMPACT

Introduction

WALQING (an acronym for Work and Life Quality in New and Growing Jobs) is a research project funded by the European Commission's 7th Framework Programme, involving 11 European partners. The project addresses the aim of EU policy to 'create more and better jobs'. In the course of the project, a number of activity (sub)sectors were isolated that had experienced an important increase of employment over the last few years, notwithstanding the global economic recession. The Belgian partner within the WALQING research team, HIVA (Research Institute for Work and Society, KULeuven) was given the mission to study two activity sectors more profoundly, of which one was the 'green' construction subsector. An important element in the study design was the in-depth exploration of three companies active within the energy-friendly construction sector: one small company, a major one and a medium-sized one. In these companies, a number of knowledgeable persons were interviewed (top, middle and lower management as well as commercial and technical staff members), and also a number of blue collar workers. On top of that, the research team tried to obtain a general view on the sector via interviews with numerous spokespersons (mostly exempted professionals employed by trade union organisations or employers' associations).

It should be emphasized that this synthesis report only deals with one specific niche in the 'green' construction market, namely the building of new (private) houses or flats.

Eco-friendly constructions: what's in a name?

In the 'green' construction sector, the terms 'sustainable, passive, eco-friendly' are often mixed up. In this section we try to distinguish between these notions.

What is passive?

The 'passive' concept of constructions originated in Germany. Already more than 10,000 passive dwellings have been built in this country; in the rest of Europe as well figures are on the rise. A passive construction needs to adhere to the following three criteria:

1. heating should not surpass 15 KWh/m².year (for a classical construction, heating requirements oscillate between 105 and 150 KWh/m².year). Contrary to what the broad public supposes, even a passive dwelling needs additional heating facilities to avoid rooms staying below 16°C in wintertime;
2. the construction should be air-tight. This criterion means that the dwelling is completely draught-free - an important parameter in defining living comfort.
3. in summertime, overheating of the rooms should be limited: inside temperatures should only exceed 25°C in less than 5% of the time.

What is energy-friendly?

E-standards are a completely different approach. The E-concept was introduced by the European Union: it takes into account the nature of the heating sources and the K-value of the construction (the K-level refers to the insulation characteristics of a building in its totality). The lower the E-value, the more energy-efficient is the construction. So-called *low energy* houses have an E-value below 60. At the moment, the E.U. imposes E60 (before the end of 2009, E80 was sufficient).

Subject articles

What is eco-friendly?

Eco-friendliness is a somewhat vaguer concept than passive or energy-friendly, and, on the other hand, goes way beyond. It has everything to do with sustainability and, apart from energy consumption and the use of renewable energy sources, the notion of recyclability is key. Eco-friendly dwellings in principle make optimal use of sunshine by a well-considered orientation, harbour energy-efficient domestic appliances bearing an A+ label and are lit by energy-efficient lamps.

Short overview of the main findings

Building an eco-friendly dwelling is, for the time being, something that requires lengthy practical experience and a history of experimenting and improvising. There exist no codices whereby good practices are explained, nor ready-made scenarios. There can be no doubt that the 'green' construction sector has known a marked expansion, in the first place with respect to house-building. This is due to the fact that international and federal standards will gradually tighten acceptable energy consumption in constructions. It should not be forgotten, however, that this niche in the market used to be heavily subsidized.

Strictly speaking, functions in the eco-friendly construction sector cannot be considered as new professions. *It's more like variations on the same old tune*, said one Business Manager. *The fuss made about 'green' jobs is mostly due to the history of conservatism that has always been a main feature of the construction sector as a whole*, added one Sales and Marketing Manager. *Nothing much ever changed in here, but the eco-friendly image the sector nowadays wants to reflect, will undoubtedly speed up some evolutions that otherwise would have been slow in getting off the ground.*

There exist, though, some really new professions in the 'green' building concept. Examples are the civil engineer calculating how a new building should look like when you want

it to be a passive construction or how an existing one can be turned into a house with an acceptable E-score, or the junior engineer who measures the degree of air-tightness just before the construction is being delivered. But these are highly qualified technicians. The only new tasks at blue collar level are the activities meant to making constructions air-tight; however, these do not induce supplementary jobs, but are rather additional operations to be conducted by roofers and bricklayers.

Some general tendencies that seem to apply for the whole of the eco-friendly construction sector are the following:

- Whatever the techniques used, constructing an eco-friendly dwelling is obviously not an activity exclusive to larger construction companies. Small enterprises as well rather quickly seem to master the know-how, and manage to make a living out of it.
- If there is any impact on job conditions, it appears to be in a positive direction, amongst other reasons because building sites need to be better organised, require tighter planning and more cooperation between the different trades. Occupational safety and health receive more attention, not only because eco-friendly products provoke less nuisance but due also to the impact of the EU Directive on temporary and mobile construction sites.
- The switch to 'green' constructions goes hand in hand with two major evolutions:
 - ✓ a drive towards standardisation. Energy-friendly construction processes have at least one thing in common: accuracy and a sense of detail are paramount. Matching building elements; finishing off corners, doors, sockets and ducts; taping insulation mats in-between cavity walls; mounting standard triple glazed windows; insulating truss constructions... it all has to be done with extreme caution, otherwise cold bridges are inevitable and air-tightness tests fail without mercy. More and more construction elements therefore are manufactured in central workshops or are delivered on the spot by specialised contractors. This goes hand in hand with the

Subject articles

growing importance of a central technical department where activities focus on detailed work preparation. An important unit of this department is the drawing office, producing building plans drawn up in great detail, including e.g. the position of heating elements and ventilation shafts. Only then can building blocks be produced in the central shop or at specialised contractor's premises.

- ✓ a tendency towards accelerated outsourcing of activities. It is common in the construction sector that enterprises always rely heavily on subcontracting. Construction is a highly volatile sector, because strongly subject to fluctuations in the market: it goes up and down rapidly. *If we want to keep the work load for our staff constant, we are obliged to proceed with subcontracting*, says one Operations Manager. This seems to be inspired as well by recruitment bottlenecks (see below): due to labour market imbalances, it is next to impossible to quickly hire new construction workers. The switch to 'Green' construction techniques seems to further accelerate the already widespread appeal to subcontracting.
- A major problem, even for small companies situated in an area with rather high unemployment figures, is attracting valuable staff members. A striking conclusion is that the vocational courses organised within the regular education network seem to have little added value. Having a like certificate does not seem to heighten the odds of getting hired by the sector. Similar courses organised by local unemployment agencies, on the other hand, are definitely considered valuable. But it will do so step by step, without fundamentally or drastically changing the workers' job content. Neither will it strongly influence either job quality or the competencies required.
- The construction sector seems to be evolving towards a classical example of a dual labour market: on the one hand, for managerial and technical functions highly educated applicants are attracted; on the other hand, for blue

collar functions classical craftsmanship (masonry, carpentry, electricity) is less valued than personality features such as accuracy and particularly capacity for work. This implies that promotion perspectives for the lower hierarchical levels will grow to be utterly reduced.

- Apart from this, there is perhaps a more important reason why some lowly educated applicants give the construction sector the cold shoulder: more than in the past, youngsters seem to value family life and leisure time, and this is at right angles to the long working days common in the construction business.
- This last point seems to be the real bottleneck for further growth. The scarcity of valuable blue collar workers, and the lengthy training period necessary for turning novices into skilled builders that work according to the company's standards, is a major threat. This is probably the main reason why the two smaller companies participating at the research project are forced to stick to a steady, rather slow growth: rapid changes in work volume cannot be coped with because temporary workers with experience in eco-friendly construction techniques are nowhere to be found. The one company that cherishes outspoken growth ambitions, a relatively large enterprise, aims to achieve its objectives through subcontracting – not by hiring more staff.

By way of a clincher:

All interviewees maintained that being a builder is still an attractive profession. Technicity is rapidly growing, customer contact is more and more frequent, and jobs are stable and well-paid. A competent bricklayer, or by extension everyone working in the construction sector, will always find a job. In this sense, job security has always existed in the construction sector and will continue to do so, at least in Belgium. On the other hand: the combination of frequent overtime and long working days due to commuting between home, the headquarters and the various building sites turn the occupation into a rather onerous profession. This might be one of the major reasons why younger applicants for work could shy away from the construction sector. This is all the more a pity because, even in the prevailing unstable economic climate, a

Subject articles

builder who can demonstrate substantial practical experience has a definite market value, even when his formal education is only elementary.

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CLIMATE CHANGE, CONSTRUCTION AND LABOUR IN EUROPE

A Summary of the Study of the Contribution of Building Workers and their Unions to 'Greening' the Built Environment in Germany, the UK and Denmark

The purpose of this research is to examine how labour in Europe has addressed the issue of global warming, with a specific focus on the role of the building trades in three countries: Germany, the UK and Denmark in this process. The built environment now accounts for approximately 35% to 40% of energy use and GHG emissions in most European countries. Consequently reducing the carbon footprint in this sector is key to an effective strategy to address global warming.

The study reviews the overall climate policy and legislative framework of the European Union (EU) and then examines what governments in the three countries have done to reduce energy consumption, cut greenhouse gas emissions (GHGs) and limit their reliance on fossil fuels. It then looks, more specifical-

ly, at the climate policies being implemented in the construction industry and the role the trade unions in these countries have played in efforts to address the challenge of climate change. Finally, it examines some of the particular initiatives the building trades unions have taken to further the transition to a 'greener' economy, including a review of union policy prescriptions, union activities and the direct role of building workers' unions in shaping the restructuring of their respective construction industries to deal with global warming.

The study concludes that the ability of unions to play a constructive environmental role is partly dependent on the broader policy framework established by governments and partly dependent on their influence within their own industry. Where union density is high and where unions are significant players in training and workforce development, enabling them to exercise significant control over the construction work their members perform, such as in Denmark and to a lesser extent in Germany, they have had considerable success in shaping the environmental policy of the construction industry.

Conversely where union representation is weak, where unions are marginal players in the overall labour relations system and where they have little say over training and apprenticeship, such as in the UK, they have not been able to exercise significant influence over how their industries have dealt with global warming. While the role of labour is only one factor in determining the effectiveness of climate policies in the construction sector, the presence - or absence - of union involvement does make a difference in the capacity of the three countries to implement the goal of promoting a 'greener' economy and society.

The paper was written by John Calvert of Simon Fraser University and is part of the broader mandate of the Work in a Warming World (W3) initiative sponsored by the Social Sciences and Humanities Research Council under the terms of 5 year Canadian research grant. The next phase of the work will involve a detailed assessment of how labour in the Canadian

Subject articles

construction industry has responded to global warming. The paper is to be found on the W3 web (<http://www.workinawarmingworld.yorku.ca/>).

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SUSTAINABLE GROWTH; ENERGY CONSTRUCTION IN A NO-GROWTH ECONOMY: GAZA

Bridging the gap between humanitarian response and a sustainable future

In the context of the concern for global warming and the effect of climate change, where some see the practice of controlling global warming with the big push for reduction of gas emission as a luxury, especially at the time of recession, in parts of the world such as Palestine energy and crises of resources are seen as a matter of survival and national identity. The survival is, on one hand, about being able to live your daily life with sufficient presence of electricity to get through the day or having sufficient clean water to drink due to contamination. And, on the other hand, it is about having sufficient building materials for the reconstruction of destroyed homes that can provide shelter as an alternative to tents – homes that are more efficient in the use of the essential needs – water, electricity – of the community.

The subject of energy and Palestine is one of the main hidden political tools used by the Israeli government to control and slowly disperse Palestinian communities, as well as make the whole Palestinian state dependent on Israel. Many historic centres in Palestine are losing their population due to continued reduction and lack of availability of electricity and clean water. Well over 15% of the income of Palestinians is paid towards electricity, representing a higher percentage of income spent on energy than in, say, Lebanon or Syria which is around 2%. Many Palestinian historic centres and towns are losing their populations because of the build-up of a high economic deficit to the Israeli government due to the

high price of electricity and continuous power cuts. This is even worse in the Gaza strip where over 95% of the population 'still experiences intermittent power supply, with scheduled outages ranging between six and eight hours per day, 3-4 days a week', as reported by OCHA¹, according to the Gaza Electricity Distribution Company (GEDCO).

The blockade of the Gaza Strip, one of the densest cities in the world (with a population of about 3,823 persons/km²), which started in 2006, coupled with the Israeli invasion in December 2008, resulted in the destruction of the infrastructure, including the power plants, water supplies. The electricity grid was severely damaged during the war and crucially is still not fully functional due to a lack of the most vital spare parts which Israel is preventing from entering Gaza along with any building materials. This includes 'urgent equipment such as generators and drainage pumps for reconstruction and repairs to its water wells', according to Gaza's Coastal Municipalities Water Utility (CMWU). Yet 60 megawatt of the electricity demand is gained from Gaza power station and 120 megawatts from Israel. The extensive reliance on electricity from Israel has resulted in a constant increase in the price of electricity, which the besieged Gazaians cannot afford, and therefore continuous power cuts in the city. The power cuts and shortages prevent the water flow, so increasing the risk of water contamination.

According to Amnesty International 'the inequality in access to water between Israelis and Palestinians is striking. Palestinian consumption in the OPT is about 70 litres a day per person – well below the 100 litres per capita daily recommended by the World Health Organization (WHO) – whereas Israeli daily per capita consumption, at about 300 litres, is about four times as much. In some rural communities Palestinians survive on far less than even the average 70 litres, in some cases barely 20 litres per day'.²

In Palestine there have been a number of renewable energy initiatives and everyday cultural practices to reduce the use of

Subject articles

energy and water, over the years ranging from rain water harvesting to locally made solar hot water in Gaza. In many cases the Israeli army has demolished the rain-harvesting water cisterns, some being centuries old, that were used to collect water for the dry season.

To reduce the crises of energy and water, renewable initiatives need to be encouraged and intensified. This is even more critical when it comes to addressing the re-construction of new homes - or retrofitting - as well as neighbourhoods in Gaza and the regeneration of historic centres in the West Bank region of Palestine.

In Palestine, as in many developing countries, there is lack of a compulsory energy efficiency code and incentives for investment in developing renewable energy, in addition to the main obstacles of the Israeli occupation and control of resources. Our recent visit to Gaza revealed a remarkable amount of local initiatives emerging from this situation of despair, and the sheer need to survive. Residents are using crushed concrete, mud construction, water collection solar energy in ingenious ways. These initiatives are indeed outstanding in their creativity, but it is also the case that the population requires technical assistance to fill in the gaps. There is an urgent need to relate all new building projects to the existing urban context in Gaza City and its surroundings, and above all to link these to a sustainable agenda for the future. An urgent need to accommodate the displaced population in Gaza runs in parallel with the need for new greener houses for its citizens which can address the water and energy shortage.

In Gaza a more holistic framework, appropriate technical support and pilot initiatives are essential to take further small steps out of the current crisis towards a more sustainable 'greener' future for the Gaza Strip, starting from 'greening' the current humanitarian and early recovery response. UN-HABITAT with the HABITAT Partner University of Westminster (London, UK) organized, with all housing actors, a three-day

interactive workshop in Gaza (September 2010). Participants explored affected neighbourhoods and investigated alternative ways of making design, building techniques, treatment of water and waste and the use of houses and neighbourhoods more energy-efficient and environmentally-friendly. Participants stressed the importance of focusing on the self-help traditions in Gaza and the need to view houses and neighbourhoods in an integrated manner. The idea of a Gaza Green Living Coalition emerged to build on local capacity, jointly test and initiate 'greener' practices within the framework of current projects or pilot neighbourhoods, develop support material to guide those efforts and focus on schools as 'learning' spaces for awareness-raising at community level.

The participants included all the key actors, CHF International, Islamic Relief Gaza, UN-Habitat, UNRWA, UNIFEM, UNICEF, FAO, ILO, UNDP, EMCC Engineering, MOPWH, Sustainability development Centre, Sharek Youth Forum, Contractors Union, Engineering Syndicate, Costal Municipal Water CMWU, Palestine Housing Council, Edu Acid, Islamic University of Gaza, University College of Applied Science, University of Palestine and Gaza Municipality, Al-Azhar University Al-Asqa University, Birzeit University and members of the Gaza Reconstruction Working Group. The participants in the workshop studied the affected neighbourhoods and exchanged ideas about how to make the designs for typical concrete houses for extended families more energy-efficient - keeping in mind of course existing self-help building practices, daily habits and economic realities.

The key aspects raised in discussions were:

1. Self-help/self-build initiatives by local communities.
2. Waste, water and sewage systems.
3. The use of 'invisible technologies', in the sense of everyday social habits that can create a more sustainable neighbourhood.
4. Recycling, 'grey water', sewage and agricultural production.

Subject articles

5. Current climate conditions and sustainable measures to avoid extensive cooling and heating.
6. Urgency for training, community awareness, employment and self-initiatives.

Emergency short and long term projects

The key issues and strategies emerging from the interactive workshops, and further consultations with active local groups and humanitarian/relief agencies were in three areas:

1. 'Model Neighbourhood for Salam'

Because the current initiatives in Gaza are being done in a fragmentary manner, here the different pilot schemes will be put together into a 'model neighbourhood' with a clear conceptual framework to create an environmental, economical and socially sustainable reconstruction programme. The 'model neighbourhood' is also to include projects and initiatives organized and planned by other NGO and associations within the 'Green Gaza Coalition'.

2. 'Self-Help Guidebook'

This guidebook emerges from the need to providing immediate help and support for the individual families interested in self-help initiatives, under the phrase of 'building back better'. It aims to provide technical support in terms of immediate repairs as well as new extensions and additions.

3. The 'Pilot Project'

Pilot project 2: The Learning Room_ Greening school buildings to create a 'Learning Room' typology to be inserted within an existing or new school. The Learning Room (LR) will contain all of the principles emerging from the workshops, including appropriate forms of building technology innovative part-earth walls, low-energy water and drainage system. The units will use more appropriate building technologies such as passive measures to reduce energy use, the collection of 'grey water', solid waste recycling, horizontal and vertical gardens on walls and roofs, etc.

In conclusion conservation of resources in Palestine; the West bank and Gaza is a matter of survival and national identity. In Gaza there is a high percentage of skilled labour which has been most creative with what there is in terms of materials to address shortage of energy and water, with water crises being the most critical due to soil degradation and the lack of adequate sewage treatment. In this part of the world with a high growth in population of 3.77% per year, the demand for water and electricity will be increasing more and more and, if the siege of Gaza continues, the power cuts will extend from six and eight hours per day, 3-4 days a week.

There is so much that can be done by international NGOs and through the use of training and public awareness activities as was the case of the workshops run by UNHabitat/University of Westminster's PART (Palestine Regeneration Team) without full access to materials, which is prohibited by the Israeli government. Given the creative minds, the skill and amazing enthusiasm of families in Gaza to re-build their homes more efficiently to address the energy and water crises, if the international community can provide sufficient help to set up 'green models' which can develop renewable initiatives at a sustainable level, Gaza could be a real model of use of affordable technologies. On the other hand, if the current trend continues there will be a catastrophic health problem resulting from lack of sufficient energy and clean water.

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Research reports

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RETROFITTING HOUSING

A review of the European Retrofit Network Retrofitting Evaluation Methodology Report¹

Policy

The European Union has issued a 'Climate and energy package'² known as the 20/20/20% proposals, which aim, by 2020, to reduce energy use by 20%, increase renewable energy by 20% and reduce carbon dioxide (CO₂) emissions by 20%. For the construction sector, the source of 40% of EU CO₂ emissions, the proposals will be met principally through two Directives, the Energy Performance of Buildings Directive (Directive 2010/31/EU)³, the EPBD, and the Renewable Energy Sources Directive (Directive 2009/28/EC)⁴, the RES. These Directives are intended to result in 'near zero emissions' for new and retrofitted buildings through on-site renewables, supported by new qualifications, quality assurance schemes and 'Green Deals' to promote retrofitting energy saving products and 'Feed-in' tariffs to support the development of national renewable markets in each country. The scope of the EPBD has been extended to cover virtually all buildings over 50m² and therefore now covers dwellings. It is in this context that research was carried out by the University of Westminster on retrofitting dwellings on behalf of the European Retrofit Network, part of the European Social Fund.

In order to explore the potential for CO₂ reduction in dwellings, the research focused on 3 dwelling typologies, detached, mid-terrace and mid-floor flat with both solid and cavity walls. A model building was created in SAP, the UK EPBD compliant software, with a benchmark dwelling typical of older, poorly insulated and inefficiently heated housing. The model provides CO₂ reductions for each energy-saving intervention.

Starting with the low cost solutions such as roof insulation, the retrofitting process proceeds until the costs hit a 'tipping point' where only high cost interventions will continue to

reduce emissions. This tipping point occurs at about 50-60% reductions, see figure 1.

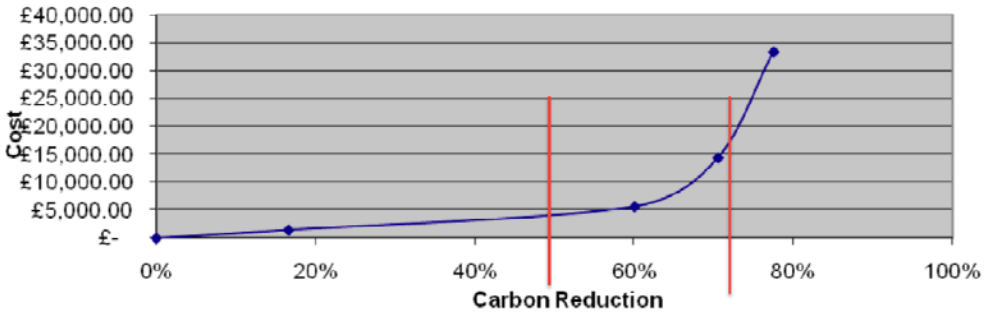


Figure 1. Source: The Housing Forum⁵

Three levels of intervention were developed based on occupant disruption, low medium and deep retrofit or near zero emissions. Using existing technologies and skills, it is possible to achieve near zero emissions with CO₂ reduced by 80-90% by applying wall insulation, air-tightness with mechanical ventilation with heat recovery, new heating appliances and controls, new windows, and renewable energy, see figure 2.

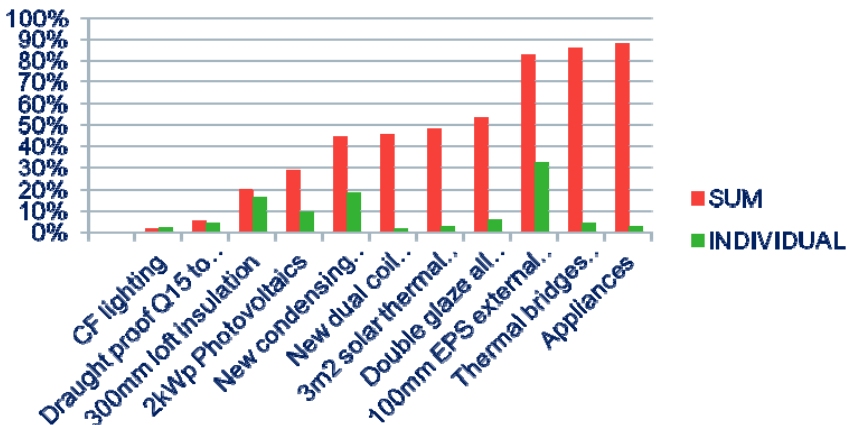


Figure 2. CO2 reduction

What is apparent from figure 2 is that just four interventions provide the bulk of the energy savings: roof insulation, new condensing boiler and controls, wall insulation and photovoltaics.

Roof insulation, draught-proofing, compact fluorescent lighting, energy label A appliances and photovoltaics will provide a 30% CO₂ reduction to a hard-to-heat house with minimum disruption. For dwellings where roof and cavity wall insulation, condensing boilers and window upgrades have already been made, as is the case with most social housing providers, further savings become progressively more expensive and provide diminishing returns. The current UK situation with the photovoltaic feed-in tariff is subject to considerable uncertainty especially since other member states (Germany and Spain) have already withdrawn subsidies from such policies. Similar uncertainty is expected with the Renewable Heat Incentive, which is planned to promote sales of heat pumps and biomass boilers to meet RES targets.

Skills analysis

Each intervention requires a skill set which may be classified as low, medium and highly skilled, and which will demand varying levels of coordination with other trades as well as varying levels of risk or health and safety duty holder responsibility, see figure 3. Skills analysis in Britain is necessarily subjective, influenced externally by the general social undervaluing of building work and from within, by sectoral isolation or the 'silo mentality' where both professions and craft trades operate in virtual isolation from each other and with their own hierarchical vision of their status. However, no intervention could be classified as low skilled without a hazard analysis-risk assessment identifying the potential for accident or non-competence. Roof insulation, for example, is often described as a do-it-yourself task, yet the Australian experience of a nationwide insulation programme carried out predominantly by a non-skilled workforce led to the scheme being abandoned⁶. At its peak (in November 2009), the programme

registered over 10,000 installers employing thousands of low-skilled workers. It was reported that there were four deaths of young Australians and over 100 house fires linked to the installation of insulation. There were also concerns regarding poor quality workmanship and materials and alleged claims of high levels of fraud by unscrupulous operators. Clearly, skills analysis is fraught with danger.

The skills analysis identifies the currently recognised mainstream skill sets as being those in demand for retrofitting. Where new skills are demanded, such as for renewable technologies, these skills build on to existing underlying skills such as plumbing and electrics.

	Low	Medium	High	Comments
CFL	*			None
Appliances		**		None
Draught exclusion Q15 to Q10		*		Access to all windows and doors. Remove curtains/blinds, prepare windows and frames
Cavity wall insulation		**		Requires scaffolded access to façade. Dwelling located within building site. Health & Safety issues
Extract fans		**		Power disruption, running of cables, builder's work, redecoration
Loft insulation	*			Access to loft, clearance, loss of storage space
PV			***	Scaffolding, access to house for running cables and meter connections,
Boiler & controls			***	Interruption to heating & hot water. Access to all radiators for TRVs. Power connections for boiler/controls. Builders work for flue
Cylinder		**		Interruption to heating & hot water.
Solar Thermal		**		Scaffolding, power disruption, run cables, builder's work, Interruption to heating & hot water.

Research Reports

Windows/doors		**		Access to all rooms, temporary security. Scaffolding
External Wall Insulation			***	Requires scaffold access to façade. Dwelling located within building site. Health & Safety issues. Potentially disruption to all services supplies and drains connections. May impact on width of access and egress leading to extensive construction works, increase in building footprint.
Internal Wall Insulation			***	Total room disruption. May be programmed room by room. Will require removal/replacement of skirting, architrave, electrical outlets and switches as well as floor coverings. Redecoration.
Q10 to Q5			***	Total dwelling disruption. Access to all rooms
Q5 to ≤Q3			***	Total dwelling disruption. Requires mechanical ventilation for IAQ
MVHR			***	Total dwelling disruption. Access to all rooms for ductwork installation, testing and commissioning. Builder's work, redecoration
Floor insulation			***	Total dwelling disruption

Figure 3. Skills analysis including coordination

Occupant – decant or stay - disruption

To carry out a deep refurbishment to 'near zero emission' will require the stripping out of the dwelling to enable air tightness provisions, wall insulation, ventilation ductwork, etc. This process generally takes weeks if not months for a team of builders working within the dwelling. The costs associated with retrofitting are difficult to detach from those associated with refurbishment – necessary building works. A review of published deep-retrofit examples shows the energy saving costs alone amount to a mean of about £25,000 per dwelling although the UK Retrofit for the Future⁷ programme established overall refurbishment costs as high as £150,000. In addition, to achieve a deep retrofit will require moving the occupants to temporary accommodation, a process of decanting. Within the UK alone there are in excess of 20 million

dwellings. UK Government targets for energy reduction by 2050 would require one dwelling per minute over the next 40 years, a programme which demands the buy-in of residents whether owner-occupiers or tenants. It would appear that the costs and logistics of mass decanting for deep retrofitting are unlikely and therefore works will need to proceed in occupied dwellings. A 'disruption to occupants' analysis was carried out to assess the impact of the energy saving measures with comments on their likely effectiveness, see figure 4.

Working in occupied dwellings will require a new level of customer relations from construction teams if the outcomes are to be successfully transferred to neighbouring homes. On top of the actual energy saving interventions, the workforce will need to consider furniture and carpet removal and storage, carpet relaying, redecoration and 'snag-free' completion. The limitations imposed by these practical considerations may prove to be the main issues for setting retrofitting standards. Where, for example, internal wall insulation is the only viable solution, skirtings, door surrounds, electrical fittings will all need to be removed leaving the room unusable and, perhaps, the house without electricity during the process. Since walls account for some 30-35% of heat loss, where this option is refused, the overall CO₂ savings are reduced. Working in occupied property may be the most challenging of issues for construction teams.

Job Projections

There is much 'noise' around the potential of zero carbon construction and retrofit to create new jobs. Job projections depend on two main drivers – the targeted level of CO₂ reduction and the rate at which such a programme is carried out. As has been shown, deep retrofit is probable only on empty properties. Pressure on social housing providers ensures that 'voids' are quickly turned over to provide rent and homes for those on waiting lists whilst owner-occupiers have no incentive to deep retrofit either before selling or before

moving into newly acquired homes. The UK Government has proposed a 'Green Deal' driven by the 'Golden Rule' where energy saving works will be funded by loans based on pay-back through metered energy savings, thus the works will pay for themselves. Such a scheme will require the development of roles such as energy assessor and financial assessor. Construction professionals will include designers and project managers whilst on-site building teams will require the full range of current building skills, enhanced by those for new technologies and materials. Supply chains will need to be developed to provide both standardized products such as insulation, photovoltaic panels and heating controls as well as the discrete, such as made-to-measure replacement windows. New surveying technologies may provide for prefabrication off-site to reduce disruption for dry lining for example. Various EU projects are currently being developed to identify training needs, certificate skills for new technologies and promote household energy saving:

'The countries shall ensure the availability of schemes to qualify installers of small-scale biomass boilers and stoves, solar photovoltaic and solar thermal systems, shallow geothermal systems and heat pumps by 31. December 2012. This shall be either with certification schemes or with equivalent schemes to qualify installers. The schemes shall be based on a set of criteria specified in Annex IV of the directive and the countries shall recognise certification from other countries as far as they follow these criteria.' (Training in renewable energy, 2009)⁸.

There are clearly opportunities to develop new jobs should such Green Deal schemes 'go viral'. In addition to these primary jobs, there are the secondary jobs, producing building materials, sales, transport, etc, which will arise should a large-scale retrofit programme take place.

Intervention	Comments	Level of Disruption
Low energy lighting	CFL becoming more common. GLS lamps to be phased out in UK by 2011	Low
Hot water tank insulation	Uncontrolled heat loss to the house leading to summer overheating.	Low
Insulated primaries	Potentially difficult to insulate in cylinder cupboards, behind boilers and where pipes go through walls	Medium
Heating controls	User interface leads to difficulty in programming heating and hot water. Default to manual over-ride	Medium
Reduced upstairs temperature	Assumes all house heating at a common temperature. Living room and bedroom temperatures for low income families indicate 19.1 and 17.1°C respectively Dependent on TRV ¹⁰ installation in all rooms and on occupant behaviour	Medium
Cavity wall insulation	Many RSLs have already installed CWI. QA issues where thermal imaging shows poor application or entirely missing	Low
Loft insulation	Many RSLs have already installed LI. Potentially disruptive where loft used as storage space. Reluctance to allow access ¹¹	Low to Medium
Draught proofing	Reduced ventilation can lead to condensation problems especially where envelope u values are low and insulation is internal ¹² . Sash windows in particular require skilled labour	Medium
Condensing boilers	Replacement generally at end of working life due to cost and length of payback ¹³	Medium
External insulation	Requires extensive external works to roof soffits, rainwater pipes, soil stacks, gulleys and drainage connections. For blocks of flats can create access issues requiring widening of balconies. Conservation issues.	Potentially High
New windows & Doors	Wide experience of window replacement market. Potential challenges where new windows interface with deep insulation and effective air tightness sealing.	Medium
Internal wall insulation	'Dry lining' requires furniture removal and loss of space during retrofit. Loss of space as insulation effectiveness increases and extensive making good to doors, skirtings, electrical outlets, etc. High cost for single room. New methods proposed for laser measuring and off-site prefabrication to lower disruption. Potential for interstitial condensation	Very High
Ground floor insulation	Requires removal of existing floor or the use of expensive 'super insulation' products such as vacuum sealed insulation with extensive making good to doors, skirtings, electrical outlets, etc.	Very High
MVHR	Very low air permeability from draught proofing requires whole house mechanical ventilation. MVHR is the most energy efficient but requires whole house ductwork installation and is thus high cost. Skills shortage in design, installation and commissioning and maintenance.	Very High
Solar thermal	Generally requires dual coil hot water cylinder, and interventions in internal central heating system plus external roof work with scaffolding	Medium

Research Reports

Photovoltaics	Scaffolding, roof work, external and internal electrical wiring. High cost currently offset by Feed in Tariff.	Medium
Heat Pumps	Highest efficiencies only achieved with underfloor heating. Poor understanding of the technology and controls ¹⁴ . Ground source more disruptive than air source	Medium to High
Micro wind turbines	Poor efficiencies in built-up areas. ¹⁵ Difficulties with fixing to roof or chimney. Scaffolding, external and internal electrical wiring	Medium
Community Biomass systems	Scope ranges from district heating to communal block heating. 'Replacing a community gas boiler may not require tenant removal but replacing a block of flats on electrical storage heaters may result in significant disruption' ¹⁶	None to High

Figure 4. Disruption

Conclusion

It would appear from the analysis that a wide-scale, deep retrofit programme for housing is unlikely in the private sector in current circumstances. Even in the public sector, which is subject to governmental regulation, the costs seem prohibitive if all the additional complexities of attendant building works and occupant disruption are factored in. For the construction industry, 'near zero emissions' will almost certainly remain focused on the new-build sector with deep retrofit projects only occurring during full refurbishment works and with sufficient financial and regulatory incentives. Green Deals will almost certainly focus on low to medium interventions, which need to be completed in about a week. These will require access to homes, faith in the payback period, trust and respect for the building team, customer relations skills, renewable certification and team working to provide fast, accurate and no-snagging completion.

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WORK IN A WARMING WORLD (W3): A CANADIAN RESEARCH PROGRAMME ON CLIMATE CHANGE AND WORK

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Context

Canada poses an unusual challenge to the struggle to slow climate warming, on three fronts. First, the federal government refuses to engage with the issue. Tracking policy changes in developed countries, Climatico National Policy Report observed in 2009, '(a) notable exception is Canada, which has remained largely dormant on the national scale.'¹ Second, because of the national policy/regulatory vacuum, Canadian response to climate warming has decentralised. The provinces either legislate alone or coordinate action in clusters, sometimes coordinating with the American states immediately to their south. Ottawa remains effectively silent. Third, the lack of national policy and national integration has had flow-on effects: environment and employment policy operate like two solitudes; the social effects of climate warming have not been factored into public policy; research on the climate warming/social impact nexus is fragmented and underdeveloped. Labour market organisations like trade unions and sec-

Research Reports

tor councils take action primarily in terms of their specific economic sectors; and good practices in transitioning employment and adapting work practices remain largely unknown outside the sector or enterprise for which they were developed. The European approach of double policy integration - between environment and labour market policy on one level, and between these and training and social welfare policies on the next, remains a wistful goal.

Research

The suite of projects that compose the *Work in a Warming World Research Programme* began in 2009, out of discussions between a group of Canadian academics and trade unionists concerned about the failure to factor the world of work into Canadian response to climate warming, and interested in developing critical opportunities for trade union leadership. The first project (2009-2010) was funded by Canada's three national research councils². It is a synthesis and analysis of the state of current research on the impact of climate change and response to climate change on the labour markets of six economic sectors: energy, transportation equipment, forestry, tourism, postal and courier services, construction. The central questions asked are:

Canadian employment is vulnerable both to climate warming and to policies to slow climate warming. What do we need to know about the uneven sectoral nature of that vulnerability? Can the world of work contribute significantly to slowing climate warming?

This first project produced:

- A publicly accessible, current bibliographic online database of almost 2,000 sources on the intersection of climate change and work. It includes international and Canadian sources, in English and French.³
- *What do we know? What do we need to know? The state of research on Canadian work, employment and climate change* (March 2011)^{4*}. This 289 page report includes chapters on each of the six economic sectors, an analysis

of Canadian research in international context, and a bibliometric assessment of the generation-long neglect by academic publications of the subject work and climate change.

In *What do we know?* the research review of the Canadian construction sector was conducted by John O'Grady of Prism Economics:

The construction sector is responsible for 30-40% of Canada's GHG emissions, taking into account the life cycle of buildings. The review looks at the relation between climate change and employment in the construction industry from three perspectives. First, the impact of 'green principles' on skills requirements, both in new training and updating training. Second, the impact of 'green' retrofitting on employment in construction. Third, the gaps and silences in the present state of knowledge.

The review found, first, that there is little research on how large the task would be to retrofit infrastructure that might be damaged by climate warming. As a result, it is impossible to estimate employment growth to repair or replace infrastructure. Second, the industry and the postsecondary system as well as the professional associations have an excellent track record in adapting training to meet new needs. Third, estimates of the employment impact of implementing green policies cannot be relied upon. Fourth, building rating systems matter in determining the application of green construction principles to new constructions and to retrofitting. However, the influence of rating systems on choice of materials, skills and work processes is not well understood. Fifth, the trades have been slow to include green construction' into skills training. Sixth, the lag by some trades in integrating green training into standards is opening the door for 'greener' industries to move outside the established system, and establish their own training schemes. Seventh, for the design professions, green certification has become increasingly important.

Research Reports

Finally, identifying the steps needed to mitigate climate change or adapt to its effects in the subsectors of the construction industry is both a policy and a research challenge. To date, the construction labour market has been largely neglected in most research. There is a pressing need to develop a relevant research agenda'.⁵

In February 2010, with a larger team⁶, *Work in a Warming World [W3]*, received five years funding (2010-2015) from Canada's Social Science and Humanities Research Council. In April 2011, the Council funded dissemination of the research to non-academic publics.

The questions W3 asks are these:

- How can Canadian institutions of work adapt more effectively, and contribute more fully, to the struggle to contain climate warming?
- If Canada embarks on transitioning to a greener economy, how will the institutions of work regulation, work organisation and the physical environment of work, as well as education and training, be required to change?

W3 studies seven economic sectors setting Canada in international perspective: agrifoods, construction, energy, forestry, manufacturing, postal and courier services, tourism. Research is organised around four themes:

- Where will you work in 2025? How will you work in 2025?
- Policy, Regulation and Governance
- Education, Training (both new training and adaptive training)
- Intersections

The first W3 project on the construction industry is headed by John Calvert of Simon Fraser University, working with the British Columbia and Yukon Building Trades Council. *Climate Change and Canada's Construction Industry: Building a Green Future* looks at the structural, organizational and technical changes that the construction industry will need to address if

it is to respond effectively to climate change and contribute to reducing Canada's greenhouse gas emissions. Specifically it focuses on:

- Projected changes in patterns of employment; expansion and contraction of skill demands.
- Future effect of structural, organizational and technical changes on competencies, standards, training, etc.
- Can green restructuring open opportunities for making the construction workforce more demographically representative?
- International experience and best practices.
- Policy recommendations.

Work in a Warming World's last symposium in 2011 was held on November 17-19, in Toronto, Canada. For further information, contact Carla.lipsig-mumme@yorku.ca.

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 6. 11 universities, 21 partner organisations, 44 researchers
- * See the review in this CLR-News by Colin Gleeson

Review essay

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LESS IS MORE: ENERGY SECURITY AFTER OIL (in press)

To limit global temperature rise, the EU announced in 2009 a target emissions reduction of 80% below 1990 levels by 2050¹. EU member states are responsible for around 11% of world global warming gas emissions which derive from 6 main sources – energy supply 31%, transport 24%, buildings 12%, industry 20%, agriculture 10% and waste and ‘other’ 3%. Buildings, however, consume directly or indirectly much of the energy supply such that their total contribution is about 40%, with households emitting some 27%. EU policy is to promote emissions reduction through new renewable electricity generation, energy saving and Carbon Trading emissions allowances supported by Clean Development Mechanisms – emission reductions in the developing world. Member states have announced different approaches based on their current energy mix and energy use. Denmark, for example, will continue pursuing its already successful approach to energy self-sufficiency through more renewable electricity and renewable heat combined with advanced planning and building regulations, the result of 30 years of low energy experience based on its response to the 1970s oil crisis. At the other end of the spectrum perhaps, is the UK which, in the 1970s, moved to oil and gas from North Sea discoveries and has only recently (2002) introduced what could be described as a thermally rigorous approach to new build.

Whatever the final settlement, the global electricity industry is focused on EU policy goals with: ‘an International Electricity Partnership set up...by some 30 electricity CEOs from the EU, USA, Canada, Japan and Australia meeting in Atlanta, USA. The Partnership will seek to work with policymakers and stakeholders worldwide on a roadmap designed to drive forward development and deployment of commercial technologies that will reduce carbon emissions².’ What is clear is that a deregulated, competitive electricity industry: ‘will have

to pass through to consumers the costs of emissions allowances plus restructuring costs, driving electricity prices higher³. We therefore need to consider the implications for the EU construction sector of current developments in generation and in the reduction of energy demand in existing buildings (retrofit) which, at the current rate of demolition, will still make up a significant tranche of the built environment by 2050. In the UK, policy to reduce CO₂ emissions appears to focus on electricity, much of it in the form of renewable offshore wind and nuclear, thus replacing coal, oil and gas for both electricity generation and final use in buildings and for transport. Whilst the increase in renewables is supported by energy saving, it is renewables that are the primary focus for CO₂ reduction, a process which is aimed at supply rather than energy end-use.

Olivier and Simmonds⁴ in *Less is More: Energy security after oil*, provide an alternative solution based on many years of practical experience in the low-energy construction sector as energy consultant and architect respectively. In their 200 page book, commissioned by the Sustainable Building Association (AECEB)⁵, they argue that focusing on large scale renewables to decarbonise the grid, such as off-shore wind, is extremely expensive and leaves the grid subject to even higher peak loads in winter as building space heating and hot water needs are transferred from fossil fuels to electricity along with the electrification of transport. The authors assess where energy is actually used and note, on the basis of 2009 statistics, that only 12% of delivered energy is essential electricity for lighting, pumps, fans and appliances. Such an upgrade to appliance efficiency could lead to a greatly reduced electrical grid where decarbonising is more readily achievable.

Since 46% of UK delivered energy⁶ provides low temperature heat for space heating and hot water, their engineering 'exergy' analysis (energy has quality as well as quantity) supports combining electricity generation with district heating as

the preferable solution. Examples include district heating supplied by combined heat and power (CHP) backed up with large scale solar thermal installations such as can be seen in Denmark and Germany. Heat, unlike electricity, can be stored long term for later use and is therefore more self-balancing than intermittent wind-based supplies which require backup from conventional generators or from continent-wide interconnections in the form of a planned but untested 'super-grid' supplying an increased UK load by a factor of up to 6. They argue that an overall increase in electricity demand from buildings and transport marginalizes essential electricity and makes it vulnerable. Reducing electricity demand to essential electricity supports a decarbonised grid which is more stable and able to supply demand based on tidal, geothermal and biomethane CHP supported by intermittent supply such as wind and where surplus generation can be used to manufacture clean synthetic fuels thus effectively 'storing' the electricity. Their insistence on large scale proven heating engineering systems to replace smaller, individual, installations is again based on an engineering analysis where higher efficiencies are achieved from professionally designed, installed and maintained plant which guarantee full operating efficiencies from technologies such as heat pumps, an example being Helsinki's heat pump driven district heating and cooling.

Their arguments are supported by an economic evaluation of options based on Energy Return on Energy Invested (EROEI). 'It is the availability of cheap energy which has driven human development over the last couple of generations. We need to find a viable alternative which is affordable. New technologies are very capital-intensive compared to fossil fuels. High EROEI has been achieved with fossil fuels but as large oil fields are replaced by shale oil the EROEI reduces. What is left of our fossil fuels should be used to support the shift to renewables with their low EROEI in order to escape the looming 'energy trap' where high investment combines with low output.'

Because of their insistence on economic analysis they dismiss the nuclear option since the full costs of nuclear are dependent on government subsidy for a range of hidden externalities including insurance against accident. Importantly, they also argue for re-regulation of the supply market to provide Least Cost Planning (LCP), the concept of the 'negawatt',⁷ where funding for energy savings replaces the cost of new generation; a policy introduced in California in 1975 and which has returned after the deregulatory pressures of the 1990s because it has stabilised energy consumption and looks about to actually reduce it, a policy also applied to heat supply in Denmark. LCP pushes energy policy to consider both supply and demand with a range of carbon neutral generation alongside a 'lavish investment in energy efficiency wherever it costs less than new energy supply.'

Their approach is to present an energy strategy to 'beyond the meter', arguing that while billions are spent subsidising energy supply, energy efficiency programmes are expected to be self-funded. The UK has, as yet, no firm policy for existing buildings apart from the Green Deal. The Green Deal is premised on the Golden Rule that the costs of retrofitting will be matched by energy savings with, currently, an expected limit in investment for residential property of between £6,500 and £10,000 (€7,600 - €11,700). Within the UK it is common practice for occupiers to off-set their bills by lowering indoor temperatures or by heating only part of their home for comfort. Experience of retrofitting points to the 'rebound effect,' where occupiers raise their indoor temperature in response to lower and more affordable fuel bills, thus increasing the comfort of their homes but reducing emissions savings. For emissions savings at the demand end, only a significant retrofit can accommodate the rebound and still provide significant savings.

Olivier & Simmonds approach retrofitting by arguing that 90% emissions savings are possible through wall insulation, new roofs, draught-proofing, new windows, etc, but state that some of these are high cost measures and the timescale availa-

Review Essay

ble for fitting them may be shorter than the natural timescale of building repairs and thus even more expensive to fit outside the natural repair cycle. However, they argue that in a classic urban/suburban semi, it is more economical to attain these savings via distinct approaches which complement each other: ultra energy-efficient appliances, coupled with more modest thermal retrofits, supported by district heating from low carbon intensity networks. They suggest that the UK Committee for Climate Change seems to have studied UK energy flows from a top-down supply perspective rather than looking at the pattern of energy use downstream. 'Given UK fossil supplies and balance of payments, the only significant option is to begin far reaching improvements in energy efficiency. Energy efficiency is cheaper than energy supply and energy efficiency avoids the need to incur the marginal cost of the more expensive new energy supply options.'

This book is a serious attempt to re-address energy use from the perspective of two eminently qualified authors. Olivier and Simmonds provide an evidence-based approach to a decarbonised future which empowers citizens by permanently removing much of the burden of high energy bills through energy efficiency. Their solutions for effectively responding to global warming, based on proven technologies working in parallel with Least Cost Planning, would mean that the future trajectory of Europe's energy supply and demand will not only be the major construction issue over at least the next 40 years but would be a programme based on the needs of the population rather than solely on those of the energy suppliers. Researchers need to identify, among other things, vocational education and training demands for the engineering construction sector's new renewable generation and wide-scale district heating networks, as well as identifying the full impact on the 'building' sector of a national retrofitting programme. We would like to thank the authors for the opportunity to review *Less is more* while it is still in press.

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Reviews

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What do we know? What do we need to know? The State of Canadian Research on Work, Employment and Climate Change.

Lead author: Carla Lipsig-Mummé, 2010¹.

This Canadian report, part of the 'Work in a Warming World' research programme², aims to identify knowledge gaps in climate change science, in particular its social impact through employment and skills in a number of employment sectors. The report begins with an overview of the 'stop, mitigate, adapt' response to climate change in terms of new or updated employment skills. It focuses on five economic sectors - tourism, postal, transportation, forestry and construction - in terms of the potential number of new jobs, requisite new skills and the role of a socialised response; this review focuses on the construction sector only.

Lipsig-Mumme's themes arise from an extensive literature review which encompasses the range of sources available to researchers and the general public, including grey literature³, making it: 'a more comprehensive study of the state of Canadian knowledge on the impact of climate change for work and employment than any other to date⁴.' The report's primary theme is that climate science is a social issue and there is a need to 'socialise' its findings due to the lack of collaboration with social science. '*Social climate scientists* call for linking climate science and social science, in order to create an effective, timely and active social policy response to climate warming.'

The report: 'focuses on policy integration, asserting that a double policy integration is necessary: first, integrate transitional policies for employment and human resources management with environmental policy; next, integrate employment and environment policies with the suite of social welfare policies necessary to cushion the geographic, community and employment dislocation that will occur. Without this double integration, there is a risk that attempts to imple-

ment policy to slow climate warming will fail.’ This is the assertion that climate change policies will result in negative impacts leading to loss of jobs as well as the potential for new green employment. A double policy integration will require: ‘strong, creative, interventionist states, for job creation, incubation of green technologies, training for green competencies, crafting and realizing climate policy that will slow climate warming.’ These are big themes which are political in their aim, to question neo-liberal approaches to what has been described elsewhere as the biggest threat to humanity.

In order to clarify what green jobs mean, the report: ‘addresses the confusion surrounding the definition of ‘green’ and ‘greening’ jobs, as these relate to work practices, and the economy.’ It seeks to define whether a green job is an entirely new construct or an addition to existing employment skill sets; what kind of new jobs, new skills, how many new jobs? Importantly, the report re-focuses on political engagement and the ‘range of ways in which workers and workplace organizations can play an active, adaptive role in greening the economy and the labour process.’ Greening the economy’ is a process, a direction, and a space for active engagement by individuals, labour market organizations, businesses, communities and governments.’

Finally, it: ‘draws attention to the difficulties in coordinating mitigation and adaptation strategies to reduce the production of greenhouse gas emissions.’ This addresses the complex interactions between the impacts of climate change, mitigation technologies and ownership of responses.

This agenda is socially driven. It primarily asserts that discussion of climate change demands a social response in conjunction with the raw science. It seeks to address responsibility for driving change internationally, governmentally and at a local level through the interaction of a social partnership of individuals and collectives. The research addresses the role of

the state as the prime actor in driving the response to change and the opportunity to develop a democratisation of this response through worker involvement.

The research on the construction industry has been authored by John O'Grady⁵ who asserts that climate change will drive employment patterns in its two main sectors, civil/engineering infrastructure, and new/existing buildings. The work will focus on upgrade and replacement and therefore the potential for new jobs and the skills requirements of 'green construction' principles to offset calamitous climate impacts (sea rise or melting of the permafrost) and lowering the carbon footprint of the built environment. The report identifies three themes:

- Infrastructure – roads, bridges, harbours, etc, where the impact of climate change is little understood and therefore so is the need for planning capacity to respond to future demand.
- Green construction employment – retrofitting existing building stock. What is the potential for jobs and what are the new skills requirements for engineers, architects, technologists and the skilled trades.
- Observations on gaps in understanding of the impact of climate change on human resource planning in the construction industry.

Since the macro impacts of climate change are so little understood, modelled as computer assessment of probabilities, little is said about responses to changes in infrastructure; a debate further complicated by 'infrastructure deficit' (a history of under spending). The report focuses almost entirely on buildings, both new and retrofitting.

Canada's construction sector is dominated by small companies, with 51% of construction workers classed as employees employed in establishments with fewer than 20 employees. 40% of construction workers are self-employed, whereas workers employed in large engineering infrastructure are

predominantly unionised with the trade unions providing 'hiring halls' as part of collective agreements. Significantly: 'Most craft unions operate training programmes for their members. Many of these programmes are delivered through well-equipped training centres that are owned by unions or by trustee funds. Training is typically financed by negotiated contributions to "training trust funds" which may be operated by the union or jointly with employers.'

The report provides insight in to the fractured nature of Canadian construction employment with variations in 'closed-shop agreements', trade registration and union membership across the different Provinces and the role of Trades Qualification (TQ) holders. However, most construction trades are recognised across the Provinces as regulated occupations which abide by national standards based on National Occupational Analysis (NOA). 'The role of NOAs is critical, since these analyses are the basis for changes in trade standards and skill requirements.'

Engineering and Architecture is regulated by professional associations, statutorily recognized, and operate under licence. Professionals are university educated on accredited degree programmes giving professional bodies 'significant leverage' over course content and quality. These professionals are supported by technologists certificated through college programmes. O'Grady points to building rating systems, such as Leadership in Energy and Environmental Design (LEED) and Energy Star as driving professionals towards green skills through having to design to these standards. Thus there is the underlying assumption that having to meet such standards is already driving professional practice and university courses to respond to climate change.

Green construction methods and principles are identified as: selection of materials, extent of pre-fabrication and extent of site mechanisation with the assertion that green construction jobs and skills are driven by these considerations. 'No studies

were identified which explored whether 'green construction' principles *per se* increase or reduce labour requirements for new construction.' If this is the case, then there is a significant gap in research since Canada has been exploring low energy housing through its R-2000⁶ programme since the 1970s. There is clearly a research opportunity in Europe to explore and compare these impacts on, for example, the UK Code for Sustainable Homes or Passivhaus certification.

O'Grady identifies retrofitting existing buildings as the principal source of employment studies. He is scathing of most assessments for job creation, commenting on 'aggressive assumptions' in the complex issues of credible forecasting and identifying four of these complexities:

- Macroeconomic – the discount rate which provides present value assumptions on energy saving investments;
- The breadth and intensity of retrofit – breadth is the availability of buildings and intensity is the depth of retrofit, from shallow to deep;
- Wage rates, labour productivity – he cites reports assessing job numbers based on half the current rate of pay or unrealistic productivity levels;
- Multiplier effects – jobs from spending on retrofit. He notes that this spending will be diverted from other areas and hence multiplier effects require great caution.

He asserts that: 'Forecasts of this type may play an important role in policy debates. However, they are of little value to those engaged in human resources planning.'⁷

It seems to be agreed that green construction jobs will demand the same generic skills of those already in the building sector but require 'add-on', such as renewable energy knowledge, installation techniques and diagnostics. 'Many existing jobs (especially such as plumbers, electricians, metal workers, and construction workers) will simply be redefined as day-to-day skill-sets, work methods and profiles are greened.' This is similar to the views of UK ConstructionSkills: 'For the majority of work required, we've identified it will be knowledge, rather than skills, that will need improving. Prob-

ably 90 per cent of the skills required to build a zero-carbon home are already within the workplace at present.⁷

O'Grady states that: 'There are two dimensions to introducing "green construction" training to the construction trades. The first is incorporating 'green construction' principles and methods into the training standards for apprentices. The second is providing upgrade training to persons who have completed their trades training.' He notes that the Canadian private sector is providing training in renewable technologies, a situation mirrored in the UK Microgeneration Certification Scheme, which is dependent on product manufacturers for training in low zero carbon technologies such as heat pumps and biomass boilers. He states that this shift to the private sector leads to a lack of common standards and certification.

O'Grady quotes studies which indicate: 'the major barrier to expanded energy efficiency training for the trades is that the demand for energy efficient buildings is not yet sufficient to trigger the requisite changes in the training systems.' Were government funding available to promote retrofitting, then: 'that access to government monies for retrofitting be linked to support for labour standards, training and apprenticeships thereby linking green construction spending to broader trade union goals.' This is a return to Lipsig-Mummé's demand that: '*workers and workplace organizations can play an active, adaptive role in greening the economy and the labour process.*'

The report provides an extremely useful introduction to Canadian construction, the role of trades unions in providing training and in jointly setting national training standards. Its comments on new skills or new knowledge are reflected in debates in the EU member states. It is particularly useful in debunking agenda driven estimates of green job numbers. The report's true significance for this reviewer lies in its explicitly political overtone, demanding a reassessment of climate change response from a social perspective.

1. http://www.yorku.ca/warming/resources/documents/W3_Final_Report_new.pdf
2. <http://www.workinawarmingworld.yorku.ca/>
3. Grey literature is 'information produced on all levels of government, academia, business and industry in electronic and print formats not controlled by commercial publishing, i.e. where publishing is not the primary activity of the producing body.'
4. The bibliographic database is available at: <http://www.workinawarmingworld.yorku.ca/>
5. <http://www.ogradey.on.ca/JohnOGrady/index.html>
6. <http://oee.nrcan.gc.ca/residential/personal/new-homes/r-2000/about-r-2000.cfm>
7. This is a very useful confirmation of the need to clarify assessment methodologies for retrofitting job numbers in the UK: 'The Green Deal is likely to support 100,000 jobs by 2015 and up to 250,000 when it reaches its peak and will be great news for local economies with local firms encouraged to get involved in this new exciting industry.': http://www.decc.gov.uk/en/content/cms/news/pn11_021/pn11_021.aspx
'We will be creating 175,000 jobs in an average year over 20 years in construction, refitting houses and buildings. According to the input output tables, this should create about 61 indirect jobs for every 100 direct jobs.': <http://www.climate-change-jobs.org/sites/default/files/Jobs%20gained%20%26%20lost%20-%20tech%20note%203.pdf>
8. <http://www.cskills.org/aboutus/newsandevents/news/zerocarb.aspx>

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The precarious nature of knowledge professionals in Italy?

"Professionisti: a quali condizioni?" A cura di Daniele Di Nunzio, Giuliano Ferrucci e Salvo Leonardi. IRES-CIGL, Rapporto di ricerca n. 04/2011, aprile 2011. 96 pp. Free download: http://www.ires.it/files/upload/03_2011-Professionisti.pdf.

Between October 2010 and January 2011 the Institute for Economic and Social Research (IRES) of the Italian trade union CIGL carried out a survey on precarious conditions among 'knowledge professionals' in Italy. 'Knowledge professionals' are commonly perceived as being able in the long run to provide for their own economic support and face limited social risks because of a relatively strong bargaining power in the labour market. However, this survey intended to differentiate the economic and social conditions of knowledge profes-

sionals in Italy by three main different occupational statuses: self-employed, employee and trainee. It reveals that a significant proportion of knowledge professionals in Italy, in particular self-employed and trainees, face high social risks and lack of social protection.

The Italian welfare state remains highly selective and oriented to regular employees, while the self-employed have very limited access to social protection schemes and unemployment benefits. Moreover, self-employed are often faced with high discontinuity of their working lives, and their overall contribution to social protection often does not fulfill the minimum requirements of access to those schemes. 48.1% of the respondents of the survey denoted a high level of uncertainty of social security in case of unemployment. Nonetheless, the higher risk in terms of social security associated with being self-employed is not compensated by higher earnings. Only 17.1% of self-employed reported earning more than €30,000 per year and 44.4% reported earning less than €15,000 while comparable figures for dependent employees are 18% and 35% respectively. In addition, earnings inequalities can be found between different contractual arrangements: those working under temporary contracts, such as temporary collaborators on a continuous or project-related basis, are strongly concentrated among those earning less than €15,000 per year.

The 68% of self-employed identify themselves as freelance workers with low social protection. 95% find themselves in a worse position in terms of economic treatment, professional acknowledgment and work organization than the dependent knowledge workers.

The report also outlines the high social and economic risks of trainees in knowledge professions. They are often denied welfare provisions and assigned high labour intensity tasks with strict deadlines without, in turn, being systematically involved in a detailed training programme. 91% of trainee

Reviews

respondents expressed a low level of satisfaction with their training experience. They declared that training has not produced a real improvement in their position in the labour market.

Clearly the report illustrates a classic characteristic of the Italian labour market: a high segmentation between insiders and outsiders. On the one hand, we find standard and socially protected workers (insiders) who benefit from a high level of job protection and stability, also entitled to generous income-replacement benefits in case of unemployment. On the other hand, non-standard workers and a significant proportion of self-employed (outsiders) are those who suffer from cumulative disadvantages: they are often excluded from any kind of income protection due to the predominance of work-based social protection schemes, and their economic treatment is generally lower than that one of standard workers.

In addition, on reading the results of this survey on the level of satisfaction of being a knowledge professional in Italy, another problematic issue of the Italian labour market is raised: the condition of self-employment is not always chosen voluntarily by the worker but comes through market necessity or employer imposition. In particular, often the management in small and medium enterprises cannot rely on large resources to manage and reward knowledge professionals. Consequently, knowledge-based activities tend to be carried out by self-employed. Processes of outsourcing the workforce and strategic managerial choices regarding temporary work often correspond to an abuse of young trainees and an improper use of self-employment where the self-employed *de facto* work as subordinated employees with very limited autonomy. The reality of the working conditions under this occupational status provides scope for a debate about different claims that needs to be brought forward in the political agenda: more extensive social security protection for the self-employed such as pensions and sickness benefits, income support in the event of job loss (unemployment benefits), regu-

lation of training courses related to career, the fight against abuses particularly in respect of young practitioners, and improper use of self-employment.

Today Italian trade unions find themselves under twofold constraints: all these issues represent a challenge and at the same time an opportunity that extends outside the traditional scope of union representation but can attract outsiders towards a new unionism in pursuit of social guarantees. All depends on the extent to which unions will adjust their interests to match those of knowledge professionals with a broader campaign for inclusion.

Peter Tom Jones and Vicky De Meyere,

Terra Reversa. De transitie naar rechtvaardige duurzaamheid. (The transition to fair sustainability). Antwerp/Utrecht: EPO & Uitgeverij Jan Van Arkel 2009, ISBN: 9789064455438, 360 pp. € 14.95.

John Huige and Lou Keune,

Plan voor een Duurzame en Solidaire Economie in Nederland. (Plan for an sustainable and solidary economy). Utrecht: Uitgeverij Jan Van Arkel 2011, ISBN: 9789062245147, 120 pp. € 10.00.

English pdf of the manifest: <http://www.economischegroei.net/wp-content/uploads/afgd-brochureengels.pdf>

The authors of *Terra Reversa* formulated an ambitious and strong plea for an integral policy of sustainable production and consumption. In the first section, with the title 'Business as usual is no longer an option' the actual crisis is described mainly from an ecological perspective. Economic growth is no remedy for this crisis. The alternative is formulated in the next section where a transition strategy is outlined that should lead to a socio-ecological responsible economy and a sustainable consumptive model. Section three provides four practical transition cases: in the transport sector, in the food industry, in tourism, and in the construction sector.

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Reviews

The chapter that deals with construction is optimistic; as construction has such a bad record, the sector has a lot of 'low hanging fruits' within reach from which it is relatively easy to earn substantial sustainability results. Based on experiences in Belgium and the Netherlands, the effect of passive houses, smart grids, cradle to cradle and other closed life cycles is treated. The authors also see important barriers: the general attitude of the actors in the sector, the lack of qualification in this field starting with architects, and the structure of the sector and its suppliers. Nevertheless, the concrete proposals based on the 4 E-model (*Enable, Encourage, Exemplify, Engage*) provide the reader with a lot of food for thought about the use of sustainable materials, efficient use of energy, possible pilot projects, environmental friendly financing and the necessary education and training.

The book is worth reading and I do not see important lacunas. However, one challenge that is perhaps only slightly touched upon is the necessary change on the supply side of the industry. Are companies and their workforces ready for the tremendous change that is needed and that will lead to a completely different product to be delivered? In fact this problematic aspect is only signalled in the necessary qualification changes for architects. But is sustainable building not a process that relates to all actors? What does it mean for the (unstructured) production process; how to prepare the workforce; how to change the classical division of labour into a more holistic approach? Or do these actors just have to wait till consumer demand and trends change and then adapt to this changing demand?

The challenge of a broader social and sustainable reform is promoted in the book *Plan voor een duurzame en solidaire economie* (Plan for a sustainable and solidary economy) that has been published recently. The authors (John Huige and Lou Keune) are part of a growing network of academics and practitioners that have joined forces (www.platformdse.org). The network organises meetings and discusses the path to a

Fair and Green Deal (FGD). In the title and its lay-out the publication refers to a reform-plan (Het Plan van de Arbeid – The Employment Plan) that was formulated in the 1930s by the Dutch social democratic party as an answer to the global crisis of that time. In the book the ecological and social dimension of the actual crisis are seen as a consequence of the neo-liberal ideology that has reigned over three decades. The book stresses the urgency of a fundamental reform of our economy. In the chapter dealing with the necessary transition, the authors refer to *Terra Reversa*. An important difference with the Terra book is the improved analysis of the socio-economic dimension of the actual crisis.

For Dutch readers the works reviewed can be recommended as a useful introduction to the debates among progressive researchers and activists in the Netherlands and Belgium.

Humphrey McQueen, *We Built This Country: Builders' Labourers & Their Unions 1787 to the Future*, Ginninderra Press, Port Adelaide, 2011, 364 pages. ISBN 978-1-74027-697-9.

Jan Cremers,
AIAS, University
of Amsterdam

In almost twenty years of existence CLR-News has only rarely reviewed books that tell the history of the building workers' trade unions. Humphrey McQueen's book *We Built this Country* is an exception. The reason why we have picked it up is rather simple. McQueen, who calls himself a Canberra-based activist and freelance historian, has written a remarkable book that covers more than 200 years of building workers' experiences and thus opens 'a window into the making of the Australian working class'. Although the research and writing was commissioned by the Construction Division of the Australian CFMEU (the Construction, Forestry, Mining and Energy Union, the successor organisation of the Australian Building Labourers' Federation), the financing of its publication owes nothing to the union.

Reviews

The building labourers entered the CFMEU in 1994 but it took a while before this unofficial history that wants to be 'sympathetic to the union's difficulties but not apologetic for their failures' could come on the table. One of the reasons was that the twenty-five years before the merger had been a period of bitterness, with media-highlighted de-registration, criminal convictions and internal conflict. McQueen's book includes defeats as well as victories because 'nothing is gained by recounting only the good side'. Some of his used concepts are extremely topical. For instance, the notion that the expansion of capital depends on the disciplining of labour-time or that re-skilling around concrete gave the labourers the chance to lift themselves from the bottom of the labour market. The book is rich in stories and case studies. Therefore, a review is an incredible challenge; it is easier to recommend reading. Nevertheless, I want to highlight a few parts.

In the early days of British colonialism tradesmen landed with ideas about who should do what on a building site and found out that it was impossible to maintain these rules in a society where the demand for craftsmen outran the supply. Assistants learned how to manage the job alongside the tradesmen and started chasing contracts. Subcontracting increased sweating. Changes in materials and methods in the late 1890s opened more pathways for labourers. However, the temporary and mobile nature of the work on building sites and the fluctuations in urban development with 'men following for two weeks at the job' and labourers shifting between industries and trades remained the key characteristics of the building sector. The history of the ABLF, created in 1910, and the preceding organisations and initiatives, therefore, was a history of 'ups and downs' and sometimes of 'stumble and fall'.

An interesting chapter is dedicated to the appearance of 'weird mobs' (named after *They're a Weird Mob*, a popular book in the 1950s about an Italian journalist moving to Aus-

tralia and finishing up laying bricks). If Australia was a country of migrants, than construction was the main industry for people to end up in. For ABLF officials building labouring was the work available to men at the bottom of the heap, irrespective of colour. Therefore, they took pains to make sure that the newcomers got their right money under decent conditions. In 1966 ABLF leaflets on the Sydney opera house site were in English, Spanish, Greek and Italian. Notwithstanding this basic principle of equal treatment, there were also times, most often coinciding with a downturn in the economy, with rumours about foreigners on sites.

For reasons of space McQueen has posted longer extracts from the words of workers and detailed accounts of several matters on his website. Here also information can be found of his other book *Framework of Flesh* (see the report in CLR-News 2-2008). Visit: <http://home.alphalink.com.au/~loge27/>

Guy Standing (2011), *The Precariat. The new dangerous class*. London & New York: Bloomsbury Academic, 198 pp. ISBN: 987-1-84966-351-9, £19.99 (pb) / £60 (hb)

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The Precariat! offers an intriguing and comprehensive insight into the plight of dissatisfied young, migrant women workers and unemployed around the world today. Breaking with stereotypes of laziness and lack of discipline or work ethic, Standing shows that the opportunities open to a growing group of people in our societies are, in fact, far from satisfactory. Forced to change jobs, functions or occupations time and again, the precariat lives in a chronic state of insecurity, never knowing whether next month's income will suffice to pay the bills. In seven chapters, Standing discusses the phenomenon of precariousness in the 21st century, the global developments that led to its spread, those affected by it, their biggest issues as well as two future scenarios (the politics of inferno and paradise).

Reviews

The book is a combination of a critique of capitalism (and its agents across the political spectrum, in state institutions and social partners) and an analysis of the working conditions of flexible workers around the world. *The Precariat* is bold in both claims and narrative, sometimes hurrying over the substantiation rather than disrupting the flow of the argument. It is above all, a good read.

Guy Standing argues that a new class (the precariat) is in the making and that the way politicians and policy makers deal with its concerns, will mean the difference between cohesive societies and turmoil, between increasing inequality and decent work for all. Consisting mainly of youth, migrants and women, members of the precariat are the victims of decades of neo-liberal and third-way free-market thinking. They pay the price for increasing flexibilisation of labour markets, stagnant wages and rolled-back social security. Members of the precariat, Standing argues: '...all share a sense that labour is instrumental (to live), opportunistic (taking what comes) and precarious (insecure)' (p. 14).

Young people, Standing argues, are educated in costly educational institutions that prepare them to be employable workers rather than autonomous citizens. They enter jobs for which they are overqualified, which offer no career prospects, income and job security, or control over their own work. Jobs being overwhelmingly short term, youth spend much of their time looking for any job, reskilling to be prepared for their desired job and worried about their futures.

Women, in addition, enter the labour market from a position of economic marginalisation and hindered by society's dismissal of the value of any form of work that is not labour, such as care work and volunteering. By the same rationale, the unemployed are increasingly coerced into employment (while sufficient jobs to host them may not necessarily exist). They are portrayed as lazy if they refuse a job offer, perhaps for the bad quality of the work, non-labour obligations or be-

cause of the hassle to get back on benefits when the position disappears again in a month or so. Migrants, often labouring under the same or worse working conditions, additionally face growing resentment from the old white working class who fear for their own and their children's wellbeing in the face of downward social mobility and the risk of outsourcing or offshoring of working-class jobs.

Standing attempts to gather these members of what he calls the precariat under the title of a new social class, based on their shared insecure and intermittent relationship to the labour market. They are the lowest social class, operating on the same level as the unemployed and socially ill. Above the precariat labours the working class (wage workers with social and employment security), above them the *proficians* (professionals who are flexible by choice) and *salarit* (those in stable jobs with social and employment security, but also greater control over their own time as signified by their monthly salary rather than hourly wage); all the way up at the top reside the super-rich, or *elite*. (pp.7-9)

The main conceptual ambiguity in the book might derive exactly from calling the precariat a *class-in-itself*. Standing's insistence in describing the precariat within the framework of social class, prompts questions such as, whether the people involved change social class every time they lose a job or find one; whether school drop-outs vandalising the streets of London are really the same class as the Ivy-league graduate interning for near to nothing at the Ministry of Foreign Affairs; and whether the occupations of their parents (traditionally the measure of an agent's social class) still matter. Undoubtedly, the precariat are all affected by, or victims of, the same social phenomenon; Standing certainly makes a very convincing argument for that. A less ambitious theorisation, however, for example as an issue of core-periphery or a closure mechanism, would not have weakened his claim.

Reviews

Standing goes on to analyse the global developments and societal discourse that led to increased insecurity for this group of people and its consequences, making a number of refreshing observations on the way. Two particularly interesting points concern the mismatch between the sector-based organisation of trade unions and the realities of the precariat; and the adaptation of social policy to an increasingly flexible labour market.

The first point is that precarious jobs are often not sector bound and therefore more difficult to organise in traditional trade union structures (p. 78). After all, a call centre employee or a receptionist might work for an insurance company, an airplane carrier service, a market research company, and so on. Possibilities are endless. Time horizons of members of the precariat are additionally short term and their next temp job is more likely than not to be in a different sector. This kind of job, effectively, might be compared to what Marc Augé coined *non-places*:² purely functional places that, once entered, could be anywhere in the world, such as airports or McDonalds. Lower service jobs could be in any sector, for any client, paid by any company, in any city, and always in the same target-based depersonalised setting.

Secondly, noting that many of our social security systems were built on a social contract between state, employers and employees, Standing observes that when the bond between employees and their employers weakens (the job for life disappears and employers are no longer willing to pay a family wage), social policy needs to move in the opposite direction, filling the vacuum created in the market (p. 30-31). Standing would seem to imply, that trade unions (and left wing politicians and the precariat) need to have a stronger institutional agenda, later specified by the author as the basic income.

The last chapter offers a brief presentation of those basic income proposals. They offer a departure from the multitude of means-tested, behaviourally conditional and complex assis-

tance schemes that Standing views both as paternalistic and destructive to societal solidarity. The basic income is to be a modest monthly payment, unconditional and individual, topped up with allowances for special needs and set counter-cyclically by an independent authority. By its introduction, the extreme uncertainty of the precariat would be reduced to moderate uncertainty that one can cope with and recover from.

All in all, Standing presents a fascinating argument for a complete overhaul of societies to turn the tide of economic insecurity and growing inequalities. His essay is a very worthwhile read. Read it, however, as a plea for social justice, rather than for its academic precision and substantiation. Those searching for a comprehensive overview of the basic income argument are better off reading Standing's earlier publications on the matter.

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1. *Editor's note*: 'The proletariat, the bourgeoisie and now the precariat – people whose economic lives are precarious with little or no job security and few employment rights'. Guy Standing
 2. Augé, Marc (1995), *Non-places. An introduction to the anthropology of supermodernity*. London/New York: Verso.

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