Our Changing Environment and the Prospects for Decent and Sustainable Work

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Debating the Future of Work: Challenges and Prospects
Hilton Hotel Sheffield, 28-29 May 2019
• Digital Technology Solutions (in heavy industry) to a Changing Environment
  • What prospects decent and sustainable work?
    o The ILO: The future of work in a changing natural environment
    o Heavy Industry and the Environment
    o Industry 4.0: Digital Technology and Work
    o The Prospects for Decent and Sustainable Work
“Environmental sustainability will disrupt the world of work”, but... “Sustainability... is not a job killer”

Sustainability = structural economic transformation, but more and better jobs... Environmental sustainability can be compatible with decent work

Job destruction (e.g. coal) but job creation (e.g. renewable energy) = decarbonisation = 18m jobs created and 6m jobs lost – but unevenly distributed by region and sector (see Stroud et al. 2014; 2018)

Resource intensive sectors (mining and manufacturing) = circular economy (see Table 3)

The importance of human capital and social dialogue – skills transformation and building consensus for long-term environmental sustainability

(Montt, Frage and Harsdorff, 2018)
Heavy Industry and the Environment

- **A Sustainable Europe 2030** e.g. 32.5 per-cent improvement in energy efficiency by 2030 (i.e. GHGs emissions; but also a focus on environmental degradation from resource extraction [e.g. materials, water] – and transportation) and pollution
  - Environmental Regulations: compliance and innovation – a beneficial constraint (Porter and Van der Linde, 1995)
    → Greening Operations and Operatives i.e. greening processes and greening jobs and skills (e.g. to reduce energy consumption; raise awareness of environmental issues) (Evans and Stroud, 2016)

The Environment and the Steel Industry
- The production of steel accounts for approximately 5% of total CO2 emissions. It is the largest industrial emitter and a prime focus for governments.
- Improvements in energy efficiency have led to reductions of about 50% in energy required to produce a tonne of crude steel since 1975 in most of the top steel producing countries.
- Further improvements in energy efficiency, by making the greatest possible use of state-of-the-art technologies (di Carvalho, 2010).
Industry 4.0: Digital Technology and Work

- ‘Technological innovation must be one of the solutions to climate change’ (Räthzel and Uzzell, 2013: 251)


  - Digitisation and virtualisation;
  - Clouds and Big Data
    - Wearable Technologies;
    - Micro- and Macro-Tasks;
    - AI and robotics displacing workers (see Lloyd and Payne, forthcoming)

- Pfeiffer (2017) and “digital despotism”
  - *Industry 4.0*: a political discourse and ‘campaign to change the way we work’
  - Obtain worker consent and acceptance to technological change that follows ‘an ideological script written by powerful economic actors’
  - Role of technology as instrument of control or collective solidarity
• WaterWatt: Gamification Digital Application Technologies and Energy Efficiency
  o H2020 Project: Improving energy efficiency in foundation industries (metals, cement, ceramics, chemicals, paper)
• DroMoSplan: Drone Technology and Efficiency and Productivity
  o RFCS Project: Improving efficiency (and identifying pollution) in the steel industry
• European Steel Skills Agenda (ESSA): Industry skill needs emerging from digitalisation and sector restructuring
  o Erasmus+ Project: Skill needs broadly, but a core focus on digitalisation, efficiency and environmental concerns driving new skill needs

In the context of ‘greening’ operations and workers’ skills:
1. What are the terms upon which new digital technologies are accepted by management and workers?
2. What are the ‘powers’ and ‘interests’ at play on the insertion (within organisations) of new technologies?
3. What will be the new patterns of skills development and recruitment emerging from technological change?
• Orlikowski (1992) and Edwards and Ramirez (2016) – the ‘effect’ of technology (soft determinism)
  → intended effect and unintended effect; direct and indirect effects; reconstitution in use; the immanence of the effect; the degree of success; discontinuity

• Hall and Soskice (2001) – Varieties of Capitalism
  → Co-ordinated and Liberal Market Economies and Patterns of ‘Green’ Skills Development, Innovation and Workplace Relations
The Prospects for Decent and Sustainable Work

- Green jobs characterised by higher levels of non-routine cognitive skills – have a higher dependence on formal education (Consoli et al. 2015) – implications for displaced low skilled/poorly qualified workers (unless upskilled);

- Country differences in opportunities for decent (high skilled, high waged) work as workers (e.g. by technology; restructuring) become displaced (e.g. Stroud et al. 2018; Evans and Stroud, 2016);

- Intra-sector (e.g. steel) country differences: a) engagement with digital technology; b) compliance and innovation in the greening of skills

- Technologies and new forms of work organisation and re-distribution of tasks (e.g. monitoring teams and data analysis): Drones = outsourcing + enhanced/diminished work and autonomy

- Discontinuity (Edwards and Ramirez, 2016): greater surveillance (regulation and control) – ‘dataveillance’ (Lupton 2016) and ‘function creep’ from digital technologies aimed at efficiency (drones; gamification applications) – country differences in levels of resistance, trust and dialogue:
  o Data on ‘green’ issues e.g. efficiency; pollution levels – difficult to contest, but performance data may be used for other purposes and the initial consent may never have been given (direct and indirect effects)

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### Table 1. Examples of upskilling to new occupations

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<thead>
<tr>
<th>Occupation(s)</th>
<th>Core Training</th>
<th>Upskilling</th>
<th>New Occupation</th>
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<tbody>
<tr>
<td>DK</td>
<td>Industry, electricity/energy</td>
<td>Knowledge of energy sources, ability to integrate energy systems, project</td>
<td>Manager in renewable energy</td>
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<tr>
<td></td>
<td>technician/technologist</td>
<td>management</td>
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<td></td>
<td>VET qualifications/tertiary</td>
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<td>engineering qualifications</td>
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References & Project Information


DroMoSplan: This project has received funding from the European Union’s RFCS grant agreement No. 710066 http://www.dromosplan.eu/

WaterWatt: This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 695820 https://www.waterwatt.eu/


Stroud, D. et al. (2014) Skill development in the transition to a 'green economy': A 'varieties of capitalism' analysis The Economic and Labour Relations Review 25(1), pp. 10-27