

2016-01-01

Are green jobs safe jobs? Identifying research gaps on chemical and biological hazards

Sabrina Gravel

IRSST, sabrina.gravel@irsst.qc.ca

France Labrèche

IRSST, france.labreche@irsst.qc.ca

Joseph Zayed

IRSST, joseph.zayed@irsst.qc.ca

Suivez ce contenu et d'autres travaux à l'adresse suivante: <https://pharesst.irsst.qc.ca/affiches>

Citation recommandée

Gravel, S., Labrèche, F. et Zayed, J. (2016, 5-8 septembre). *Are green jobs safe jobs? Identifying research gaps on chemical and biological hazards* [Affiche]. 25th EPICOH Epidemiology in Occupation Health Conference, Barcelone, Espagne.

Ce document vous est proposé en libre accès et gratuitement par PhareSST. Il a été accepté pour inclusion dans Affiches par un administrateur autorisé de PhareSST. Pour plus d'informations, veuillez contacter pharesst@irsst.qc.ca.

ARE GREEN JOBS SAFE JOBS?

IDENTIFYING RESEARCH GAPS FOR CHEMICAL AND BIOLOGICAL HAZARDS

Sabrina Gravel^{1,2}, France Labrèche^{1,2}, Joseph Zayed^{1,2}

¹Institut de recherche Robert-Sauvé en santé et en sécurité du travail

²Department of Environmental and Occupational Health, Université de Montréal

CONTEXT

- The transition to a greener economy is based on new technologies, innovative and modified processes, or new materials with lesser environmental impact.
- Jobs held in industries improving human welfare while reducing environmental risks and footprints are called “green jobs”.
- Several OHS hazards have been reported for green jobs, e.g. repetitive movements, falls, noise, and electricity.
- However, little is known about chemical and biological hazards associated with these newly identified green jobs.
- “Green jobs” take place along a continuum of employment, from traditional industries with new materials (e.g. electronic waste recycling) or new high-tech settings (e.g. LEED construction), to technologically advanced industries (e.g. solar and wind power industries).

OBJECTIVES

- To identify the major occupational health and safety (OHS) issues and research gaps regarding chemical and biological hazards in green jobs.
- To produce a portrait of the research conducted on green jobs.

METHODS

- State of knowledge and Identification of research needs**
 - Literature reviews and progress reports from major OHS research institutes
 - Consultation of published expert forecasts, research recommendations, stakeholders’ surveys, and white papers
- Research portrait**
 - List of ongoing or recent research projects posted on the website of 20 international OHS research institutes.
- Covered period : 2008 to 2014**

DEFINITION

OF A GREEN JOB

Can be considered a green job, any that is directly aimed at reducing the environmental impact of human activities and endorses the principles of sustainable development. Green jobs, which may require specific skills or knowledge, involve the development, innovation and use of adapted technologies, techniques and processes

RESULTS

- Four major industrial sectors stand out:**
 - Energy supply
 - Waste treatment
 - Construction
 - Green chemistry
- Overall, 25 research projects were identified**
- The research institutes interested in green jobs are:**
 - IRSSST, Canada
 - WorksafeBC, Canada
 - NIOSH, United States
 - Electric power research institute, United States
 - Green Chemistry Campus, Netherlands
 - HSE, United Kingdom
 - BAuA, Germany
 - NRCWE, Denmark
 - TNO, Netherlands
- New hazards are the hallmark of green jobs, yet few studies focus on hazards identification**
- Research needs in specific sectors:**
 - Transportation electrification
 - Construction
- Only two epidemiological studies:**
 - Research on the effects of biofuel dust on airways and genes (NRCWE, Denmark)
 - Health effects of exposure to bioaerosols and effectiveness of exposure control measures in composting (BAuA, Germany)

ORGANIZATIONS CONSULTED



METHODOLOGICAL CONSIDERATIONS

- Restricted Time frame (≈ cross-sectional)**
- Language (English & French only)**
- Finite list of research centers consulted**
- Information source (websites of research institutes)**
 - Level of detail of information
 - Ease of access to information

CONCLUSIONS

- The term “green jobs” is relatively new but raises interest in OHS research
- Green jobs OHS research is still an underdeveloped niche
- The four priority industries are also amongst those with the highest level of chemical and biological risks
- Main issues in green jobs:**
 - New or unknown occupational hazards and exposures
 - Known hazards encountered in new work conditions
 - Inflow of untrained, often vulnerable, workers
- Research needs are numerous in terms of hazard identification, exposure assessment and risk assessment**

REFERENCES

Cheneval E, Busque M-A, Ostiguy C, Lavoie J, Bourbonnais R, Labrèche F, Zayed J. Les emplois verts au Québec - définition et appréciation de leurs risques potentiels sur la santé des travailleurs. IRSSST, 2015. Document No.: R-875.
Cheneval E, et al. Green Jobs: Definition and Method of Appraisal of Chemical and Biological Risks. Ann Occup Hyg. 2016; 60(3): 290-304.
Elwood P, Bradbrook S, Reynolds J, Duckworth M. Forefront of New and Emerging Risks to Occupational Safety and Health Associated with New Technologies in Green Jobs by 2020. Luxembourg: EU-OSHA, 2013. (PHASE I – KEY DRIVERS OF CHANGE).
European Agency for Safety and Health at Work. Priorities for occupational safety and health research in Europe 2013-2020. Luxembourg: EU-OSHA, 2013.

STATE OF KNOWLEDGE			RESEARCH TOPICS				
Industry	Particularities	Hazards	Hazards identification	Exposure assessment	Risk assessment	Exposure control	
ENERGY SUPPLY	Solar energy	Emerging industry & limited trained workforce → inflow of young, more vulnerable workers	Manufacturing: cadmium, metal dust, adhesives and solvents Installation: asbestos and silica	Industry-wide (2 studies)			
	Wind energy	New materials	Manufacturing: epoxy, solvents, fiberglass and styrene Installation (confined spaces): lack of oxygen, toxic fumes, resins and solvent vapors	Health and safety hazards at work and prevention strategies	Styrene	Industry-wide	
	Biofuels	New materials (third and fourth generation)	Known for first and second generation biofuels: exposure to acids and enzymes New for third and fourth generation biofuels: algae and bacteria Lack of knowledge regarding biofuel powered engine emissions			Health effects in mining industry; Effects on airways & genes	Research program on sustainable technologies
	Transportation electrification	Rapid increase of market	Recycling and disposal at the end of useful life: lack of information on composition (unlabeled batteries) In case of accidents/fire: leaching batteries and toxic combustion products		Cr VI in welding (creation of exposure database)		Ventilation in welding
WASTE TREATMENT	Recycling	Workforce with little training, often intellectually challenged, low pay, high turnover rates	Sorting centers: Bioaerosols and dusts; Lack of training/knowledge for development of health prevention/protection strategies E-waste: Exposure to many chemicals, heavy metals and flame retardants	Waste woods and soil recycling	PAH, mercury and other exposures	Metals and flame retardants	Industry-wide effective control procedures
	Composting	Limited knowledge of hazards	Biological: actinomycetes, gram negative bacteria Chemical: volatile organic compounds		Aerosols, biohazards and gaz (2 studies)	General health	Effectiveness of control measures
	Biogas	Industry in development, limited knowledge of hazards	Biological: various bioaerosols Chemical: ammonia, H ₂ S and CO ₂		Chemicals and biohazards; Mapping and metrology		Risk mitigation
CONSTRUCTION	Green building	Rapidly growing market, new materials (exposure limits not yet developed), known materials (with more extensive applications)	Insulating materials: foam spray polyurethane, cellulose from recycled newspapers Water-based cover materials: varnishes and paints		Passive badge for asbestos exposure	General health	
	Recycling and reuse	Untrained workers	Dismantling: asbestos and silica				
GREEN CHEMISTRY	Alternative substances	Introduction of new hazards, product development more rapid than health effects research, exposure limits not yet developed	New exposures: allergens, substances with unknown toxicity and carcinogenicity				Substitution with bacterial and enzymatic preparations, new chemicals and coatings