



## Create green jobs To realize the benefits of low emission development

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### Key messages

- Transitions to low carbon, environmentally and socially sustainable economies can become a strong driver of job creation, job upgrading, social justice, and poverty eradication if properly managed with the full engagement of governments, workers, and employers' organizations.
- At the same time, climate change poses major risks to economic prosperity and social progress. Uncontrolled climate impacts will cause damage to infrastructure, disrupt business activity, and destroy jobs and livelihoods on an unprecedented scale.
- While the job creation potential outweighs the risks of job losses, and positive labor market outcomes can be expected overall, a just and fair transition for all is necessary, leaving no one behind.

### How is low emission development linked to employment?

Addressing climate change is imperative to preserving jobs today and to securing the resilience of economies and societies for future jobs. Estimates based on the International Labour Organization (ILO)'s Global Economic Linkages model<sup>1</sup> suggest that unmitigated climate change—with associated negative impacts on enterprises and workers—will have negative effects on output in many industries, with drops of 2.4% by 2030 and 7.2% by 2050, whereas greener economies could reverse the trend and yield productivity gains.<sup>2</sup>

The implementation of low emission development strategies (LEDS) will cause shifts in the volume, composition, and quality of employment across sectors and will affect the level and distribution of income. In particular, eight economic sectors employing around 1.5 billion workers, approximately half the global

workforce, will undergo major changes: agriculture, forestry, fishing, energy, resource intensive manufacturing, recycling, buildings, and transport.<sup>4</sup>

In general, four categories of change can be expected: some jobs will be created; some will be lost; some will be substituted; while others will be transformed in the way work is performed. Overall, positive labor market outcomes can be expected, given that the job creation potential outweighs the risks of job losses.

**A just transition for all<sup>3</sup>** means that responses to climate change should maximize opportunities for decent work creation and ensure social justice, rights, and social protection for all, leaving no one behind.

Also in the LEDS GP series on realizing the benefits of low emission development:

- Gain the competitive edge
- Ensure energy security
- Promote gender equality
- Boost ecosystem resilience
- Use trade policy

This series of short papers gives an overview of selected benefits and development goals linked to LEDS and Nationally Determined Contributions (NDCs).

Series editor: Natalie Harms, Energy research Centre of the Netherlands (ECN)

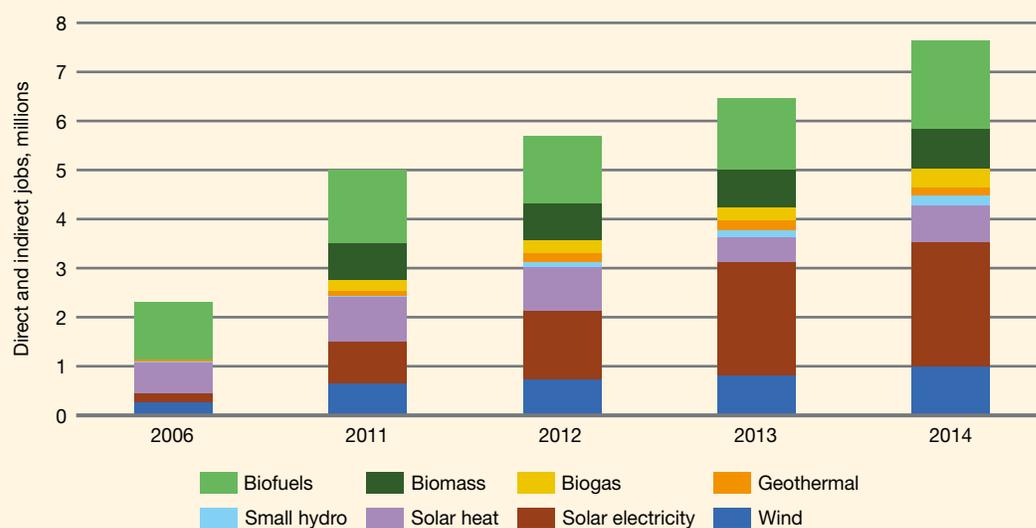
## How can low emission development create jobs?

A transition to low emission, environmentally sustainable economies and societies can be beneficial to job creation. An ILO review of nearly 20 studies examining potential impacts of carbon emissions reduction, energy, and resource efficiency finds net gains on the order of 0.5–2% of total employment, which translates into 15 million to 60 million additional jobs by 2030.<sup>5</sup>

While job losses are expected to occur in parts of the economy, concerns are exaggerated. In industrialized countries the transition between economic sectors is likely to affect only 1% of the workforce, and movements of workers between enterprises are small compared with the shifts associated with globalization. While most analyses still focus on developed economies, net gains in employment are likely to be highest in emerging and developing countries. Here, opportunities exist to leapfrog to the use of greener technology, thus avoiding the costs associated with replacing obsolete infrastructure and related employment substitution.<sup>6</sup>

### Box 1 Green jobs

Solar energy has become a key driver of green jobs, which are growing in number globally each year.<sup>7</sup>



In addition to research evidence, there are growing indications on the ground that LEDS being implemented around the world are leading to significant job creation, offsetting fears of job displacement and losses. Policies and investment expanding the use of renewable energies are creating opportunities for millions of new jobs in manufacturing and energy services, in both developed and developing countries. Reports by the International Renewable Energy Agency (IRENA) suggest that in 2014 renewable energies employed 7.7 million people.<sup>8</sup>

The use of public work programs as vehicles for addressing climate change delivers the double dividend of putting to work the poor and unemployed, and contributing to climate resilient economies and societies. South Africa's Expanded Public Works Programme created over 4 million work opportunities during 2009–14, including in afforestation and sustainable land use management.<sup>9</sup>

Gains in energy efficiency and material efficiency translate into employment gains via direct and indirect employment in sectors such as construction, transport infrastructure, equipment manufacture, and recycling. In Europe, every percentage point reduction in resource use leads to 100,000–200,000 new jobs.<sup>10</sup>

## Integrating employment benefits into low emission policies and planning

As countries prepare to start the implementation of their climate change commitments under the Paris Agreement, they find themselves in a global situation of massive unemployment, with a necessity of pursuing low emission development while ensuring jobs are not lost or destroyed in the process. Over 600 million new jobs need to be created by 2030, around 40 million per year, just to keep pace with the growth of the global working age population.

The Paris Agreement acknowledges this need, calling for a just transition of the workforce for all, meaning that responses to climate change should maximize opportunities for decent work creation and ensure social protection for all, leaving no one behind. This is essential to safeguard livelihoods and to deal with possible adverse impacts of the transformation to low carbon economies on employment and incomes in an equitable manner.

It is therefore critical for Nationally Determined Contributions (NDCs) and resulting climate change policies to account for their potential implications for labor markets in terms of job creation and losses, change in existing occupation, and skills needed for new and emerging occupations. In fact, several countries, such as South Africa, have explicitly noted the need to identify “socioeconomic implications, notably any negative impacts on employment”<sup>11</sup> in their Intended Nationally Determined Contributions (INDCs).

The ILO *Guidelines for a just transition towards environmentally sustainable economies and societies for all* offer a comprehensive framework and menu of policies that countries can draw on when implementing LEDS.<sup>12</sup> For example, the guidelines suggest that energy subsidy reforms have a better chance of success if designed with social protection and compensation schemes for disproportionately affected groups, much in line with findings by the International Monetary Fund<sup>13</sup> and other institutions. The guidelines recommend a country-specific mix of macroeconomic, industrial, sectoral, and labor policies that incentivize job growth and improve job quality through investments in sustainable, resource efficient production, as well as ‘greener’ products and services in sectors like agriculture, construction, recycling, and tourism.

Tripartite social dialogue, allowing government, employers, and workers’ organizations to engage collectively in the discussion and design of climate change policies, can prove effective in facilitating their implementation, with benefits for workers, businesses of all sizes, and society at large. This is illustrated by a review of national and regional experiences.<sup>14</sup>



Conducting surveys for clean water supply, Bawomataluo, Nias Islands, Indonesia; upland farming near Lake Sebu, Philippines; shipbuilding in Batam, Indonesia; improving the road layout in Ayala Alabang Village, Philippines. Photo credits: ILO

## Methodology and tools

The identification of employment impacts of NDCs through labor market and green jobs assessments helps to prioritize interventions, with positive employment outcomes and better climate results. Benefits assessments such as the ILO Green Jobs Assessment Reports<sup>15</sup> can help determine the potential for new job creation and point to sectors where jobs are likely to be lost, substituted, or transformed. The ILO has established a Green Jobs Assessment Institutions Network (GAIN) composed of leading research and policy institutions capable of conducting such assessments.<sup>16</sup> GAIN members are prepared to work with interested countries on labor market assessment of climate change and low carbon development policies.

EC-LEDS is developing an international tool to assess job and other economic impacts of low emission energy projects. The **IJEDI (International Jobs and Economic Development Impacts) model** will initially include data for Bangladesh, Colombia, Mexico, South Africa, and Zambia as well as an option to include specific data for other countries of interest. This international version builds on the **JEDI tool** developed for the United States and can be accessed via LEDES GP's **Development Impact Assessment (DIA) Toolkit**.<sup>17,18</sup>

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## Case study

### Training solar technicians to roll out decentralized energy systems in Bangladesh

In Bangladesh, an ILO program to train solar technicians provided employment and income opportunities for young men and women, contributing to creating a skilled workforce for the deployment of clean energy systems in the country. The solar home system and entrepreneur skills training program, implemented between 2010 and 2012, was successfully integrated in national programs through:

- institutionalization of training curricula (assembling, installation, and maintenance) in the National Technical and Vocational Qualification Framework
- provision of sustainable employment opportunities by linking trainees with renewable energy service providers (27 additional service providers) for job placements as solar technicians
- promoting solar entrepreneurship by providing skills for entrepreneurs and access to finance.

Such training programs, expanded by the Ministry of Labour and Employment, have brought solar home systems to more than 4 million rural homes.

The ILO jobs promotion program assisted five Asian countries—Bangladesh, Indonesia, Nepal, Sri Lanka, and the Philippines—in initiating the shift towards low carbon, environmentally friendly and climate resilient economies.<sup>19</sup>



*A trainee in the solar home system servicing course, Bangladesh, part of ILO's Green Jobs initiative. Photo credit: ILO*

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Critically important for enterprises and workers alike are the human skills required to deploy technical solutions and workplace practices for climate change mitigation and adaptation. The assessment of skills needed by the workforce to install and maintain renewable energy systems or to implement energy audits in buildings can help to anticipate the demand for new skills, to prevent skills shortages, and to plan the retraining of workers as sectors grow and technologies evolve.<sup>20</sup> ILO studies on skills for green jobs have found that, in some cases, the lack of a skilled workforce may constrain the growth potential in certain green sectors. Targeted training programs can help address such skills gaps (see case study).

## Resources

ILO: Green Jobs Assessment Institutions Network (GAIN)	<a href="http://www.ilo.org/global/topics/green-jobs/partnerships/WCMS_230513/">www.ilo.org/global/topics/green-jobs/partnerships/WCMS_230513/</a>
LEDS GP: Development Impacts Assessment (DIA) Toolkit	<a href="http://ledsgp.org/development-impact-assessments-tools">ledsgp.org/development-impact-assessments-tools</a>
NREL: Jobs and Economic Development Impact (JEDI) models	<a href="http://www.nrel.gov/analysis/jedi/">www.nrel.gov/analysis/jedi/</a>
EC-LEDS: Low emission development strategy tools	<a href="http://www.ec-leds.org/leds-tools">www.ec-leds.org/leds-tools</a>

## Notes

- 1 ILO: 'Global Economic Linkages Model.'
- 2 ILO (2012) *Working towards sustainable development: Opportunities for decent work and social inclusion in a green economy*. Geneva: International Labour Organization.
- 3 ILO (2016) 'Decent work and just transitions must be at the heart of climate action.' ILO News April 26.
- 4 ILO (2012) Op. cit.
- 5 Ibid.
- 6 Ibid.
- 7 Poschen, P. and Renner, M. (2015) 'Green jobs.' *Finance & Development* 52(4): 14–17, based on UNEP and others (2006 data); ILO (2011 data); IRENA (2012–14 data).
- 8 IRENA (2015) *Renewable energy and jobs – Annual Review 2015*. Abu Dhabi, United Arab Emirates: International Renewable Energy Agency.
- 9 Government of South Africa (2016) 'Expanded Public Works Programme.' Pretoria: Government of South Africa.
- 10 Council of the European Union (2014) 'Informal Joint Meeting of EU Environment and Labour Ministers, general background document, session "Green growth and employment".' Italian Presidency of the Council of the European Union.
- 11 Government of South Africa (2015) 'South Africa's Intended Nationally Determined Contribution (INDC).' Pretoria: Government of South Africa, p. 10.
- 12 ILO (2015) *Guidelines for a just transition towards environmentally sustainable economies and societies for all*. Geneva: International Labour Organization.
- 13 IMF (2013) *Energy subsidy reform: Lessons and implications*. Washington, DC: International Monetary Fund.
- 14 ILO (2012) Op. cit.
- 15 ILO (2008–14) 'Green Jobs Assessment Reports'; ILO (2013) *Methodologies for assessing green jobs, Policy Brief*. Geneva: International Labour Organization.
- 16 ILO: Green Jobs Assessment Institutions Network (GAIN).
- 17 EC-LEDS: Low emission development strategy tools.
- 18 LEDS GP: Development Impacts Assessment (DIA) Toolkit.
- 19 ILO: 'Bangladesh-Indonesia-Nepal-Sri Lanka-Philippines: Green jobs promotion.'
- 20 ILO (2011) *Skills for green jobs – A global view, synthesis report based on 21 country studies*. Geneva: International Labour Organization.

The **International Labour Organization's Green Jobs Programme** signals the commitment to act on climate change and to promote resource efficient and low carbon societies. The Green Jobs Programme has progressively assisted over 30 countries by building relevant ILO expertise and tools in dedicated areas of work. The Programme focuses on knowledge creation, advocacy through partnerships, capacity building, sector prioritization, pilot projects, policy advice, and knowledge sharing. [www.ilo.org/global/topics/green-jobs](http://www.ilo.org/global/topics/green-jobs)

The **LEDS GP Benefits Assessment and Communication Working Group** focuses on identifying, communicating, and integrating social, economic, and environmental benefits associated with low emission pathways. The group works to advise on development impact assessment to provide tools and exchange knowledge and guidance on how to align development priorities with climate change policies and measures. Contact: [benefits@ledsgp.org](mailto:benefits@ledsgp.org)

The **Low Emission Development Strategies Global Partnership (LEDS GP)** was founded in 2011 to enhance coordination, information exchange, and cooperation among countries and international programs working to advance low emission, climate resilient growth. LEDS GP currently brings together LEDS leaders and practitioners from more than 160 countries and international institutions through innovative peer to peer learning and collaboration via forums and networks. [www.ledsgp.org](http://www.ledsgp.org)

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