

# Assessing the achieved and missed benefits of Chile's Intended Nationally Determined Contribution (INDC)

NewClimate Institute

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For full methodology and project background, see: NewClimate (2015) *Assessing the missed benefits of countries' national contributions*. Accessed via [newclimate.org/publications/](http://newclimate.org/publications/)

In December 2014, Chile published a draft version of its INDC for public consultation. The draft INDC proposes two *options*, each with targets for 2025 and 2030. Chile's draft proposal is to cut the GHG intensity of its economy (that is, reduce the amount of GHG emissions per unit of GDP) between 40-45% by 2030 under the more ambitious *Option A* or to between 35-40% for *Option B* (Government of Chile, 2014a). In comparison to a current policies trajectory in 2030, according to our illustrative method, implementation of *Option A* of Chile's proposed INDC would:

- Save at least USD 2.9 billion each year in reduced fossil fuel imports.
- Prevent in the order of 700 premature deaths each year from air pollution.
- Create 7,000 additional green jobs in domestic renewable energy

If Chile strengthened its INDC to meet a trajectory towards 100% renewables by 2050 (and thus in line with keeping global warming below 2°C and possibly even 1.5°C), it could, according to our illustrative method, achieve the following benefits:

- Save USD 2.4 billion annually in reduced fossil fuel imports additional to INDC reductions, corresponding to total annual saving of USD 5.3 billion compared to the current policies scenario.
- Prevent in the order of 800 premature deaths each year from air pollution additional to the INDC improvement, totalling 1,500 deaths fewer annually than in the current policies scenario.
- Create approximately 4,000 jobs in the domestic renewable energy sector additional to the INDC scenario, totalling 11,000 more jobs than in the current policies scenario.

## Cost savings from fossil fuel imports

Chile is one of the major consumers of fossil fuels in the Americas, although, unlike its regional neighbours, Chile meets very little of this demand from domestic sources.

**Coal in the power sector:** Coal is projected to account for 32% of energy demand for electricity and heat in 2015 (APERC, 2009). Figure 1 illustrates that Chile's draft INDC would reduce coal demand in 2030 by an estimated 1.3 Mtoe (Option B) or 2.2 Mtoe (Option A), resulting in a cost saving of around USD 0.2 billion (Option B) or USD 0.4 billion (Option A). A further 1.8 Mtoe reduction in coal consumption from the INDC Option A level would be possible through a 100% renewable scenario, equivalent to further potential cost savings of USD 0.3 billion a year. This would be a total reduction of 4 Mtoe of coal in 2030, corresponding to USD 0.7 billion in cost savings, compared to current policies.

**Oil in the transport sector:** Oil is projected to account for 40% of Chile's total primary energy consumption in 2015, and 95% of its energy consumption for transport (APERC, 2009). Figure 2 illustrates that Chile's draft INDC would reduce oil demand for transport in 2030 by an estimated 1.3 Mtoe (Option B) or 2.3 Mtoe (Option A), resulting in a cost saving of around USD 1.3

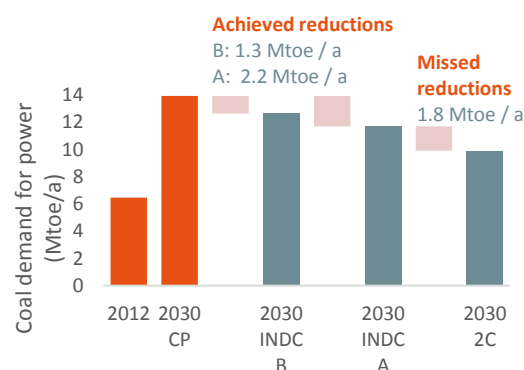


Figure 1: Coal demand from power sector

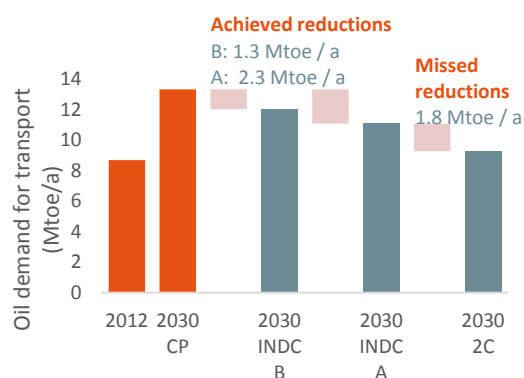


Figure 2: Oil demand from transport sector

billion (Option B) or USD 2.2 billion (Option A) in oil imports. A further 2 Mtoe reduction in oil consumption from the INDC level would be possible through a 100% renewable scenario with further savings of approximately USD 1.8 billion per year through oil imports for the transport sector. This would be a total saving of 4.1 Mtoe of oil in 2030, and roughly USD 4 billion, compared to current policies.

**Natural gas:** Demand for natural gas is expected to roughly double between 2012 and 2030 in Chile, due largely to its increased usage for expanded power supply. Under the scenarios implied by the draft INDC, Chile would save USD 0.2 billion (Option B) or USD 0.3 billion (Option A) per year by 2030 through reducing gas imports by 0.7 Mtoe (Option B) or 1.3 Mtoe (Option A), as illustrated in Figure 3. If Chile were to strengthen the INDC further to meet a 100% renewable trajectory, natural gas consumption could be reduced by an additional 1 Mtoe in 2030, corresponding to further potential cost savings of approximately USD 0.3 billion per year. This would be a total saving of 2.3 Mtoe of oil in 2030, and USD 0.6 billion, compared to current policies.

#### Premature deaths from outdoor air pollution

The health burden of air pollution is set to increase significantly in Chile up to 2030 under all scenarios analysed, due not only to emissions pathways but also demographic factors, such as population growth and the ageing of the population. Figure 4 shows that under current policies, the number of premature deaths will roughly double between 2012 and 2030. Under the INDC, approximately 400 (Option B) or 700 (Option A) premature deaths could be prevented each year by 2030, compared to the current policies scenario. Strengthening this commitment to be in line with a 100% renewable trajectory could prevent around 800 additional premature deaths every year, or a total of approximately 1,500 compared to current policies.

#### Creation of green jobs in domestic renewable energy

Under current policies, employment opportunities in the renewable energy sector are projected to increase significantly up to 2030, as shown in Figure 5. Chile's draft INDC would create 2,000 (Option B) or 7,000 (Option A) additional full time jobs by 2030, compared to current policies. However, if Chile were to strengthen the INDC to meet a 100% renewable scenario, the impact on job creation would be significant, with approximately 4,000 additional jobs created, compared to the INDC scenario, or a total of 11,000 compared to current policies. If no more large hydro power were to be installed, and Chile would meet its renewable electricity generation through other technologies, the employment benefit in each scenario would be greater still, with approximately 500 additional jobs under either INDC option, and approximately 4,000 additional jobs under the 100% renewable scenario; following a 100% renewable scenario with no new large hydro would therefore create a total of approximately 15,000 full-time equivalent jobs, compared to the current policies trajectory.

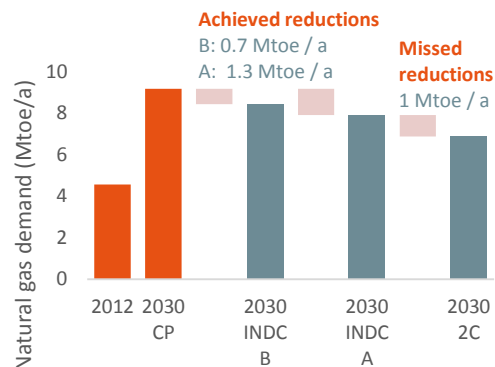


Figure 3: Reduced natural gas demand

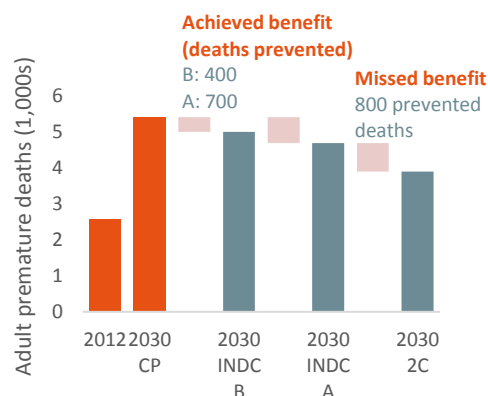


Figure 4: Premature adult deaths prevented

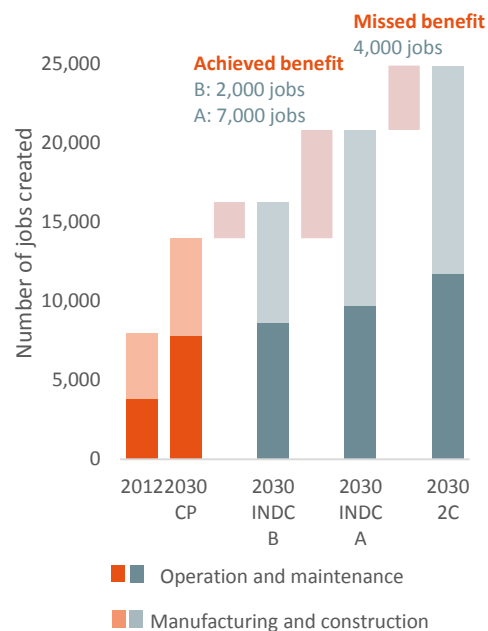


Figure 5: Job creation from renewables

## Supplementary information

See *NewClimate* (2015) for full methodology and cross country assumptions.

### Assumptions for Chile:

**INDC scenarios:** We used the draft INDC (Government of Chile, 2014a) and the results of the MAPS analysis (Government of Chile, 2014b) as a basis: the MAPS scenario “esfuerza alta” is assumed the most likely construction for *Option A* of the INDC, given that the final emissions outcome is very similar. For *Option B* of the INDC a scenario was constructed based on the midpoint between the “esfuerza base” and “esfuerza medio” MAPS scenarios. Although both options are given as ranges, calculations assume achievement of the mid-point of each range.

**Fossil fuel import scenarios:** Projected growth rates under current policies according to APERC (2009) were applied to data from the official 2013 National Energy Balance. Projections for the 100% renewable scenario were elaborated in line with the anticipated trend from the Latin America region according to the World Energy Outlook (IEA, 2014).

**Share of renewable technologies under a 2°C scenario in 2050:** It is assumed that the respective share of each renewable energy technology for total renewable energy generation in 2050 will be the same as in the most ambitious scenario (INDC Option A – MAPS esfuerza alta) for 2030, whilst the overall share of renewable energy in the total electricity mix rises 100%.

**Electricity generation projections:** Projections for electricity demand in Chile were only available up to 2030. These were extrapolated to 2040, and again to 2050, based on trends for electricity demand in the Latin American region, according to the World Energy Outlook (IEA, 2014).

**Fossil fuel import prices:** Based on the regional prices of the World Energy Outlook (IEA 2014).

It is assumed that the capacity load factor for renewable energy technologies is the same as the average load factors achieved in the Latin America region, according to World Energy Outlook projections (IEA, 2014).

Under the 100% renewable scenario, we assume that this scenario would be adopted by all countries worldwide, allowing technology to be used in Chile that is developed elsewhere. The 100% renewable scenario could be difficult to be achieved by a single country in isolation.

## References and data sources

See *NewClimate* (2015) for cross country references and data sources.

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