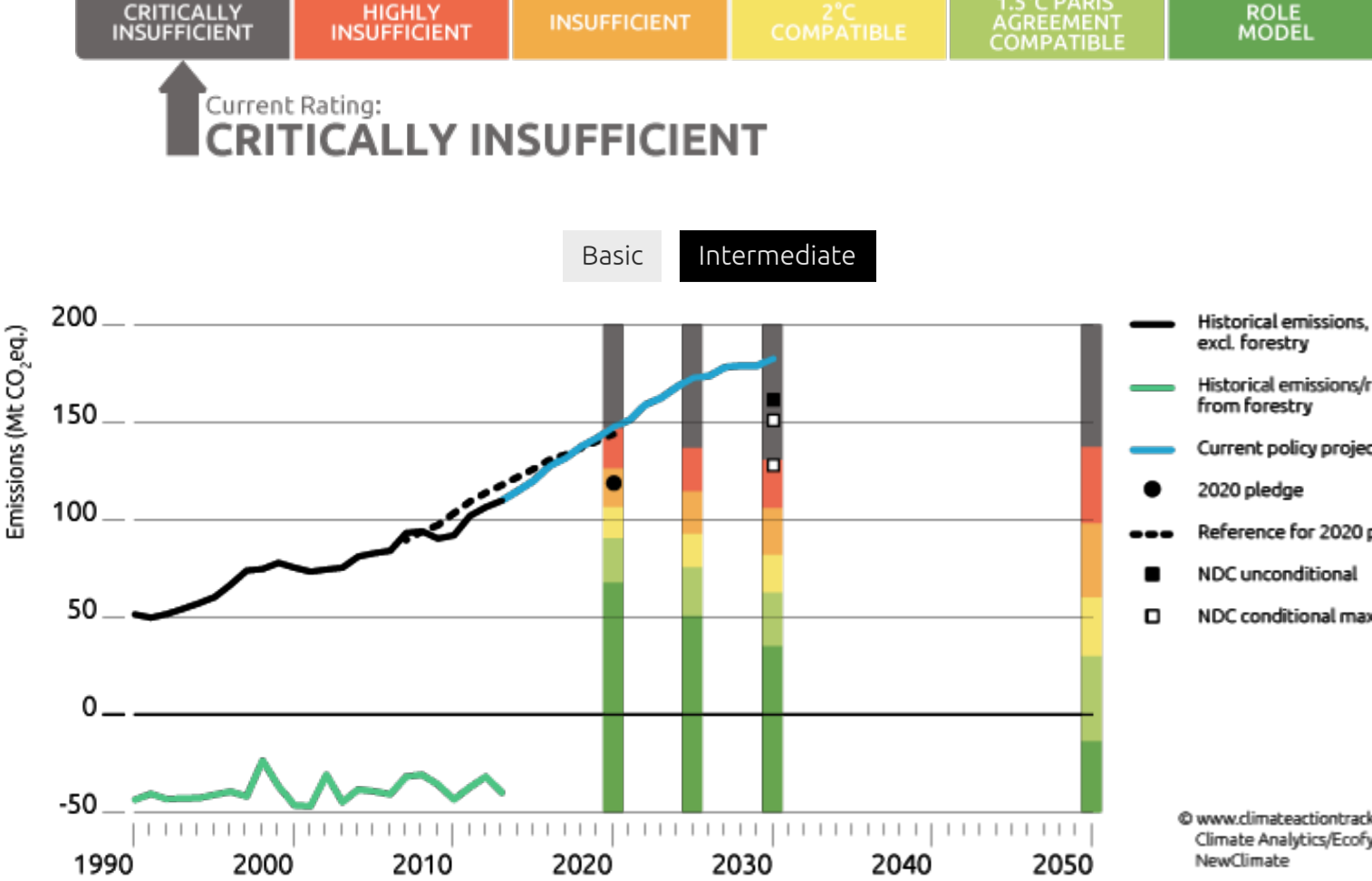


### Rating



### Assessment

Despite having significant solar and wind energy potential, without new policies, Chile's greenhouse gas emissions are projected to nearly double from 2010 levels by 2030, when it would still generate over 40% of its electricity from coal.

Chile will need to introduce an increasing number of ambitious policy interventions to limit emissions to the targets it has submitted under the Paris Agreement, including accelerating deployment of renewable energy sources and improving energy efficiency in industry. Right now, its renewable energy targets are barely more ambitious than business as usual.

Chile's **Nationally Determined Contribution (NDC)** presents both conditional and unconditional intensity-based emissions reduction targets, which would result in emissions increases of 38-76% of 2010 levels by 2030. We give Chile's 2030 climate commitments our lowest possible rating of "Critically Insufficient" – if all countries were to follow Chile's approach, warming would exceed 4°C.

Our analysis shows that Chile's targets are far from an emissions pathway consistent with limiting warming to below 2°C, let alone with the Paris Agreement's stronger 1.5°C limit. A fair and equitable emissions pathway would require Chile's emissions to stabilise and decrease over time.

Chile's NDC includes two emissions reduction targets for 2030 (one unconditional, one conditional), excluding LULUCF emissions, and additional targets for the Forestry sector. The unconditional target is a 30% reduction of GHG emission intensity of GDP below 2007 levels by 2030, which is equivalent to 215% above 1990 and 76% above 2010 GHG emissions levels, excluding LULUCF. The conditional target (conditional on international financial support in the form of grants) is a 35–45% reduction of GHG emission intensity of GDP compared to 2007 by 2030, which is equivalent to 148–193% above 1990 and to 38–64% above 2010 GHG emissions levels, excluding LULUCF.

Chile also proposes to sustainably manage and recover 100,000 hectares of forest by 2030 and to reforest 100,000 ha (Government of Chile, 2015a), subject to approval of new laws. Chile is one of the few countries to separate the LULUCF sector target from other emissions, which increases the transparency of its proposed actions. However, according to our analysis, Chile will not meet its unconditional NDC target with its currently implemented policies. Chile will need to implement additional policies to reach both its 2020 pledge and any of its 2030 NDC targets. We rate these targets as "Critically Insufficient."

Chile has taken its first steps towards decarbonisation with the Non-Conventional Renewable Energy Law (NCRE) and a carbon tax for stationary sources (turbines or boilers above 50 MW<sub>th</sub>) of USD 5/tCO<sub>2</sub>, which came into effect in 2017. Chile has also released its Energy Plan 2050, which outlines a vision for energy development, and includes renewables targets for 2035 and 2050. However, the renewable energy targets that Chile has set for itself in both the NCRE and Energy Plan 2050 are barely more ambitious than business-as-usual.

Chile is building renewable capacity and, as of December 2016, 52% of the generation capacity under construction was in non-conventional renewable energy sources (Comisión Nacional de Energía, 2016). Projections from the MAPS Chile project indicate that coal is likely to continue to play a role in Chile's energy future under current policies (Government of Chile, 2015b). In 2016, 44% of electricity generation in Chile came from coal (Comisión Nacional de Energía, 2016). Chile will need to accelerate deployment of non-conventional renewables to meet its targets.

Under the Copenhagen accord, Chile proposed to undertake Nationally Appropriate Mitigation Actions (NAMAs) to reach an emissions level 20% below business-as-usual (BAU) by 2020 (as projected from 2007). We rated this target "inadequate." Chile has various NAMA proposals moving towards implementation, which may lead the way to further emission reductions in the future.

### Pledges and targets

#### Paris Agreement targets

Chile's NDC includes two emissions mitigation targets for 2030:

- **Unconditional:** 30% reduction of GHG emissions-intensity of GDP compared to 2007 by 2030 (Government of Chile, 2015a). With a projected GDP growth of 149% over the period 2007 to 2030 (Government of Chile, 2014), we estimate this option results in emissions levels of 162 MtCO<sub>2</sub>e by 2030 (215% above 1990 and 76% above 2010 GHG emissions levels excluding LULUCF).
- **Conditional on international financial contributions in the form of grants:** 35–45% reduction of GHG emissions-intensity of GDP compared to 2007 by 2030 (Government of Chile, 2015a). We estimate this option results in emissions levels of 128–151 MtCO<sub>2</sub>e by 2030 (148–193% above 1990 and 38–64% above 2010 GHG emissions levels excluding LULUCF).

Both of the GHG emission intensity targets do not include emissions or removals from the forestry sector. In its NDC, Chile proposes separate targets to address only this sector: a) sustainable management and recovery of 100,000 hectares of forest by 2030 with estimated emissions reductions of 0.6 MtCO<sub>2</sub>e per year from 2030 and b) commitment to afforest 100,000 hectares, with mostly native species, that are estimated to capture between 0.9–1.2 MtCO<sub>2</sub>e per year from 2030 (Government of Chile, 2015a). These targets are conditional on the approval of updates to the Native Forest Law and a new Forest Promotion Law, neither of which were in place as of September 2017.

In September 2016, one year after submitting its INDC, Chile became one of the last countries to sign the Paris Agreement.

#### 2020 pledge

Chile has proposed to undertake NAMAs to reach an emissions reduction of 20% below BAU including LULUCF in 2020 (as projected from 2007). We estimate this is an absolute pledged emissions level of 119 MtCO<sub>2</sub>e in 2020 excluding emissions from LULUCF. This is equivalent to an increase of 131% from 1990 GHG emissions levels excluding LULUCF.

Copenhagen pledge	
2020 target	20% below BAU by 2020
Reference for the pledge	BAU
	[131% above 1990 GHG emissions excl. LULUCF]
Conditions	International support
Paris Agreement target	
Ratified	Yes
2030 unconditional target	Unconditional: 30% below 2007 GHG intensity of GDP by 2030 [215% above 1990 emissions excl. LULUCF by 2030]
2030 conditional target	Conditional: 35–45% below 2007 intensity of GDP by 2030 [148–193% above 1990 emissions excl. LULUCF by 2030]
Conditions	Financial support
Coverage	Economy-wide excl. LULUCF
LULUCF	Separate target from rest of emissions: management and recovery of 100,000 hectares and reforestation of 100,000 hectares of forest by 2030.
Long term goal	
Long-term goal	None

### Fair share

We rate Chile's NDC emission reduction targets for 2030 "Critically Insufficient." The "Critically Insufficient" rating indicates that Chile's climate commitment in 2030 is consistent with a warming of over 4°C: if all countries were to follow Chile's approach, warming would exceed 4°C. This means Chile's climate commitment is not in line with any interpretation of a "fair" approach to the former 2°C goal, let alone the Paris Agreement's 1.5°C limit. The reduction target could therefore be strengthened to reflect the Chile's economic capability.

If the CAT were to rate Chile's projected emissions levels in 2030 under current policies, we would also rate it "Critically Insufficient."

Most effort sharing approaches lead to similar levels of emissions allowances for Chile. The upper end of the "Insufficient" range is determined by effort sharing approaches focusing on staged emissions reductions. To be in line with the most stringent approaches, which focus on capability, Chile would need even further emissions reductions.

For further information about the risks and impacts associated with the temperature levels of each of the categories [click here](#).

### Current policy projections

Between 1990 and 2013, Chile's emissions increased by 112% from 52 MtCO<sub>2</sub>e to 110 MtCO<sub>2</sub>e, excluding LULUCF. Taking into account Chile's current policies, we estimate that emissions will continue to rise, reaching 148 MtCO<sub>2</sub>e per year in 2020 excluding LULUCF, which represents a 187% increase above 1990 levels, and 60% increase above 2010 levels. We project that emissions in 2030 will be even higher, climbing to 183 MtCO<sub>2</sub>e (225% above 1990 levels and 98% above 2010 levels) excluding LULUCF. Under currently implemented policies, Chile will not meet its NDC targets.

Chile's overarching Climate Action Plan 2017 – 2022 guides mitigation actions. It intends to advance mitigation measures by maintaining the national GHG inventory, developing policy, implementing MRV systems, and fulfilling Chile's international targets (Government of Chile, 2016a).

#### Energy supply

In 2013, 77% of Chile's GHG emissions (excl. LULUCF) came from the energy sector (Government of Chile, 2016b). The Non-Conventional Renewable Energy (NCRE) Law is one of Chile's most significant implemented policies, and aims to reach 20% of generation from non-conventional renewable energy sources by 2025.

Chile defines non-conventional renewable energy sources as wind, solar, geothermal, biomass, tidal, and hydro up to 20MW. Making progress towards this goal, in 2016, 11% of generation was from non-conventional renewable sources, and 52% of the generation capacity under construction was NCRE (Comisión Nacional de Energía, 2016). However, the NCRE law target is nearly met under Chile's business-as-usual scenario (Government of Chile, 2014), and Chile could set more ambitious targets to take advantage of its huge renewables potential (Government of Chile, 2014). In 2016, 44% of electricity generation was still from coal (Comisión Nacional de Energía, 2016), and coal is likely to continue to play a role in Chile's energy future (Government of Chile, 2014). Under current policy projections, coal will still have over a 40% share in electricity generation in 2030.

The Energy Agenda 2014–2018 supports the targets in the NCRE law and proposes additional policies that may contribute to further emissions reductions, such as implementing energy management systems on major energy consumers, efforts to decouple energy consumption from revenues in SMEs, and commitments from the federal administration to reduce energy consumption from the public sector. Additional policies promote geothermal and solar development, particularly in households (Government of Chile, 2016a).

Building on the NCRE law, Chile's Energy Plan 2050 sets long term goals for electricity generation, planning to reach 60% generation from renewable sources in 2035 and 70% in 2050 (Ministry of Energy Chile, 2015). Notably, these targets include generation from large hydro (which accounted for 24% of generation in 2016), whereas the NCRE law excludes large hydro. The construction of large hydro projects in Chile is highly controversial, largely because of significant adverse environmental and social impacts. In 2014, Chile's government overturned environmental permits for HidroAysén, a massive hydroelectric project in Patagonia, after a seven year campaign against it by the largest environmental movement in Chile's history (NRDC, 2016).

Additionally, Chile has implemented a carbon tax of 5 USD/tCO<sub>2</sub> for stationary sources (turbines or boilers above 50 MW<sub>th</sub>) which came into effect in 2017. Payments will begin in 2018.

From 2010–2013, the government implemented several policies on appliance labelling, energy efficiency, fuel efficiency standards and electricity infrastructure. Policies that stand out are the Energy Efficiency Seal (2013) and Energy Efficiency Action Plan 2012–2020 (Ministry of Energy Chile, 2013), which aims to set a suitable legal framework for energy efficiency implementation across different sectors towards a 15% energy efficiency improvement by 2025. The Energy Efficiency Action Plan is part of the government's Energy Agenda.

#### Industry

Chile is the world's leading copper exporter, and the mining and industry sector is Chile's largest consumer of both total final energy (39% in 2015) and electricity (Comisión Nacional de Energía, 2016).

The main agreement between the government and the mining industry regarding energy efficiency is the "Cooperation Agreement," under which mining companies should look for ways to use energy more efficiently, and the Ministry of Energy should support them (Government of Chile, 2016b).

Chile is considering an energy efficiency law that would possibly be legally binding for industry, but so far, any mitigation action in the mining and industry sector has been driven by private enterprises (Government of Chile, 2016b). Binding laws that reduce energy consumption in industry would be important additional policies for Chile to reduce its emissions.

#### Transport

In 2015, the transport sector accounted for 35% of total final energy consumption in Chile, second to industry (Comisión Nacional de Energía, 2016). In the same year, the government introduced the "Green Tax" on motorised vehicles, which applies to new vehicles, and is intended to incentivise more efficient vehicles. Chile also has a vehicle labelling program (Government of Chile, 2016a).

#### Buildings

The buildings sector was the third largest consumer of final energy in 2015, accounting for 21% of consumption (Comisión Nacional de Energía, 2016). Chile pursues a National Strategy for Sustainable Buildings, which includes energy, water, waste and health goals. The government also incentivises energy efficiency in public buildings (Government of Chile, 2016a).

#### Forestry

The LULUCF sector has been a sink of around 30–45 MtCO<sub>2</sub>e in the period from 1990 to 2013. The LULUCF sink was equal to 36% of Chile's emissions in 2013. Chile's NDC references two planned policies, which were not yet in place as of August 2017: updates to the Native Forest Law and a new Forest Promotion Law. These laws would reduce emissions from the Forestry sector by reducing deforestation and increase the sink through forest management, conservation, reforestation, and afforestation (Government of Chile, 2016a).

### Assumptions

#### Historical Emissions

Historical emissions from 1990 to 2013 (using Global Warming Potentials from the IPCC Second Assessment Report) were taken from Chile's third national communication, published in December 2016 (Government of Chile, 2016b).

#### Pledges

The 2020 pledge did not state a reference pathway, but specifically states that it will be a reduction from BAU as projected in 2007. We have therefore calculated Chile's 2020 pledge using as reference the 2007 BAU scenario from (Boston Consulting Group, 2013). This pathway closely resembles the 2007 BAU presented by (Searle, 2011) on behalf of the Chilean Government in the same context. As the pledge covers emissions including LULUCF, the emissions level resulting from the pledge is first calculated based on BAU emissions including LULUCF. Projected LULUCF emissions (Boston Consulting Group, 2013) are then subtracted to arrive at the pledged emissions level excluding LULUCF, which is shown in the graph. The BAU shown in the graph excludes LULUCF.

Both targets presented in Chile's NDC were quantified based on the "medium case" GDP projections from the MAPS Chile project (Government of Chile, 2014). These projections are referenced in the NDC and expect a GDP (Chilean Peso (CLPS) 2011) growth of 149% over the period 2007 to 2030. The current policy projections are based on the same assumptions on GDP growth.

#### Current policy projections

In previous assessments, the CAT has based its current policy projections on the Energías Renovables No Convencionales (ERNOC) scenario from the MAPS Chile project. This scenario includes potential mitigation measures, not all of which have actually been implemented. Therefore, for this update, we have adjusted our analysis to only include currently implemented policies. By implementing all of the measures outlined in the ERNOC scenario from MAPS Chile, Chile could achieve its unconditional NDC target.

As a starting point for the current policies projections, we took the "medium case" BAU scenario from the MAPS Chile project (Línea Base 2013, PIB medio) (Government of Chile, 2014). The "medium case" BAU scenario combines sectoral projections for seven sectors. The base year of the scenario is 2013, and it is based on macroeconomic projections from 2013 (medium case GDP projections) and includes implemented policies up until 2013. We then quantified the effects of the Non-Conventional Renewable Energy Law (NCRE), the Energy Plan 2050, and the carbon tax.

The NCRE's target of 20% of electricity generation from non-conventional renewable sources by 2025 is nearly achieved under the BAU scenario, which reaches 18.1% of electricity generation from these sources in 2025. Similarly, the Energy Plan 2050's target of 60% generation from all renewable sources in 2035, including large hydro, is nearly achieved under BAU and makes only a marginal contribution to the current policies scenario. Nevertheless, we calculate the emissions reductions that would be achieved by reaching these targets, and subtract them from the BAU scenario. This leads to an emissions reduction of less than 1% in 2030.

Chile implemented a carbon tax at USD 5/tCO<sub>2</sub> in 2017 for stationary sources with over 50MW<sub>th</sub> capacity, which is expected to cover 40% of carbon dioxide emissions (Government of Chile, 2016b). The MAPS Chile project estimated that if a carbon tax of USD 5/tCO<sub>2</sub> were applied to all sources of carbon, the emission reductions from BAU would be 3.61 MtCO<sub>2</sub> in 2020 and 5.17 MtCO<sub>2</sub> in 2030, or ~3% of BAU emissions (Government of Chile, 2014). Since the actual law covers only ~40% of emissions, we subtracted 40% of the estimated reductions (1.4 MtCO<sub>2</sub> in 2020 and 2.1 MtCO<sub>2</sub> in 2030) from the BAU scenario.

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