

Climate Goals for New Zealand in 2030:

*An Ambitious Domestic Emissions Target
within an Appropriate Share of the Global Budget*

ANNEX B

**QELRO and Decadal Emissions Budget (2021-30)
for 40% Target**

Summary

New Zealand's 2030 emissions target will be transformed into a multi-year emissions budget for the 2021-2030 period. This budget is conventionally expressed as a 'quantified emission limitation and reduction objective' ('QELRO'), denoting the average annual emissions allowed for the period.

We have calculated the QELRO and emission budget corresponding to a 2030 emissions target of 40% below 1990 levels using UNFCCC methodology, and cross-checked this with the figures used by Landcare Research in analysis commissioned by the Government. The calculations agree closely. We adopt a QELRO of 73.5 on 1990 levels¹ (49.0 Mt CO₂-e) and a 2021-2030 emissions budget of 490 Mt CO₂-e.

1. Introduction

Countries' emissions pledges are commonly stated as a single year target, as a percentage reduction from a base year. Under the Kyoto Protocol, these pledges are converted into a multi-year emissions budget for the commitment period, assuming a straight line trajectory from a defined start-point to the pledge as the end-point. This multi-year budget is what countries are ultimately accountable to meet.

The emissions budget is conventionally expressed as a 'quantified emission limitation and reduction objective' (QELRO). This denotes the average level of emissions that a country could emit on an annual basis during a given commitment period, and is usually expressed as a percentage in relation to a base year.

New Zealand's unconditional target to reduce emissions 5% below 1990 levels by 2020 was lodged under the UNFCCC rather than the Kyoto Protocol, but the Government has stated an intention to continue to apply the KP rules. The Government states: "Based on United Nations methodology, this target is equivalent to a 2013-2020 QELRO of 96.8 on 1990 emissions."²

New Zealand's INDC states that the post-2020 commitment will be in the form of an "absolute reduction from base-year emissions managed using a carbon budget".³ Economic analysis carried out for the Government has also assumed the commitment will be in the form of a multi-year budget.

2. Calculation using UNFCCC methodology

The methodology used by the UNFCCC is laid out in the 2011 presentation, 'Transforming pledges into quantified emission limitation and reduction objectives (QELROs)',⁴ along with a more detailed technical paper.⁵

The basic approach is straightforward and involves creating a straight-line emissions trajectory from a defined start point to the pledge as the end point. The QELRO is calculated by finding where this trajectory crosses the midpoint of the commitment period, which will also equate to the average annual emissions for the period.

There has been debate about the appropriate starting point to use in determining QELROs and emissions budgets, with some countries including New Zealand arguing for 'actual emissions' to be used, rather than previously agreed targets.⁶ However it seems the approach ultimately adopted in setting QELROs for the 2013-2020 period used the previous 2008-2012 QELRO as the starting point. In other words, the trajectory starts from the mid-point of the previous commitment period (2010 in this case) at an emissions value equal to the QELRO for this period (in New Zealand's case, 100% of 1990 gross emissions).

¹ That is, 73.5% of the 1990 level.

² <https://www.climatechange.govt.nz/reducing-our-emissions/targets.html>

³

<http://www4.unfccc.int/submissions/INDC/Published%20Documents/New%20Zealand/1/New%20Zealand%20INDC%202015.pdf>

⁴ https://unfccc.int/files/cancun_agreements/green_climate_fund/application/pdf/awgkp16.3_0310111.pdf

⁵ <http://unfccc.int/resource/docs/2010/tp/03r01.pdf>

⁶ For more information see WWF-New Zealand (2012): Creative Accounting and the Climate Negotiations: New Zealand's Approach to Quantified Emissions Limitation/Reduction Obligations (QELROs), http://awsassets.wwfnz.panda.org/downloads/creative_accounting_02_12_wwf_nz.pdf

Table 1

Calculations using UNFCCC methodology

	<i>2021-2030 period</i>	<i>2013-2020 period (for validation)</i>
Ys (Year of starting point)	2016.5	2010
Ye (Year of end point)	2030	2020
Ym (midpoint of commitment period)	2025	2016.5
Es (emissions at starting point, % of base year)	96.8	100
Ee (emissions pledge at end point, % of base year)	60	95
m (gradient, calculated)	-2.726	-0.500
c (intersect, calculated)	5593.630	1105.000
QELRO (% of base year)	73.6	96.8
Emissions in base year 1990 (Mt)	66.7	66.7
QELRO (Mt)	49.1	64.5
Budget for commitment period (Mt)	491	516

Table 1 shows the calculation inputs and outputs following the UNFCCC methodology. The right-hand column shows the calculation for the 2013-2020 period for validation purposes; the calculated QELRO of 96.8 agrees precisely with the value listed on the Government’s website. For the 2021-2030 period, assuming our input values are correct, the calculation gives a QELRO of 73.6 and a multi-year emissions budget of 491 Mt CO₂-e.

3. Comparison with Landcare research paper

The Government has released two papers on economic modelling undertaken in developing New Zealand’s INDC. The paper from Landcare Research, ‘Modelling the economic impact of New Zealand’s post-2020 climate change contribution’,⁷ contains information allowing us to calculate the multi-year emissions budgets corresponding to the different 2030 targets assessed.

The paper does not list the emissions budgets directly, but does list the cumulative emissions reductions required below the business-as-usual baseline projection of 853.6 MtCO₂-e over the 2021-2030 period (Table E1, p. 2). For reasons unknown, the paper also uses a different value for emissions in the 1990 base year: 63.3 Mt CO₂-e, compared with 66.7 Mt CO₂-e in the latest Greenhouse Gas Inventory and in our analysis. It is therefore necessary to adjust the emissions budgets to account for this. The results are shown in Table 2 below.

Table 2
Calculations from Landcare Research report

2030 target/pledge	Mitigation below BAU baseline (Mt)	Implied budget 2021-2030 (Mt)	QELRO as % of base year	Budget adjusted for updated 1990 base
5%	242	612	96.7	645
10%	260	594	93.8	626
20%	305	549	86.7	578
40%	389	465	73.5	490

According to these calculations, the 2021-2030 QELRO is 73.5 and the emissions budget is 490 Mt CO₂-e. These are almost identical to the results in the previous section using UNFCCC methodology.

⁷ <http://www.mfe.govt.nz/node/20771>