Kellogg Company
Climate Policy Context and Methodology
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Climate Policy Context and IPCC Methodology

The Intergovernmental Panel on Climate Change (IPCC) has shown that to avoid significant impacts, global warming must be limited to about 450 to 500 ppm CO2-eq, or 2°C above pre-industrial levels.[1] As countries, states and communities align regulations to match a science-driven 2°C warming limit, it is likely that GHG emissions will be regulated more strictly through carbon fees, taxes and trading schemes, as already seen in some regions around the globe, especially as Independent Nationally Determined Contributions (INDC) come into effect after the global climate negotiations in December 2015.

The regulatory environment is only one driver for business action. Increased price and volatility are impacting business bottom line and ability to manage risk. For example, average global energy costs ($/kwh) for Kellogg manufacturing sites have risen 65% between 2008 and 2012; Average global water costs ($/gal) have risen 70% in the same time frame, based on available SAP data.[2]

Global demand for food is on the rise, driven by unprecedented growth in the world's population and widespread shifts in consumption patterns as countries develop. The FAO projects global agricultural production will need to more than double by 2050 to close the gap between food supply and demand. As this chronic pressure increases, the food system is becoming increasingly vulnerable to acute shocks.[3]

Within Kellogg's value chain, the impact of this reality has already been felt. There have been 8 recent food price shocks since 1990, all linked to extreme weather events. In 2007 and 2008, for example, world market prices for major food commodities such as grains and vegetable oils rose sharply to highs of more than 60 percent above historic levels. [4] Amid all commodity price volatility from climate and government intervention, it has now become the conventional wisdom that crop prices will remain high and well above their long term historic levels – the continuation of the so-called commodity 'supercycle'.[5]

To limit climate change to 2°C warming, action from all sectors must be focused on mitigation and adaptation. As part of the agricultural and industry sectors, the IPCC indicates that sector emissions should be 5 GtCO2 by 2050. Baseline emissions[6] for the industry are approximately 14 GtCO2[7], meaning a 65% reduction would be needed to align to these science-based targets.

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[1] IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

[2] Kellogg internal data

[3] Dawe, David. "Emerging Risk Report: Food System Shock." Handbook on Food (2014): 100-21. Lloyd's, 20 June 2015. Web. 30 Oct. 2015.

[4] USDA: http://www.ers.usda.gov/media/218027/wrs0801_1_.pdf

[5] KPMG Food Value Report. https://www.kpmg.com/US/en/IssuesAndInsights/ArticlesPublications/Documents/agricultural-food-value-chain-report.pdf

[6] Scenarios without additional efforts – Business As Usual from a 2010 baseline

[7] IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, pp 101

As Kellogg worked to define their science-based target, this 65% target from IPCC data was the starting point as it is from this same process that national governments from around the world are using.

Kellogg Historic Reductions and GHG Modeling

As a company, and as individuals, we are passionate about enriching and delighting the world with foods and brands that matter. We understand people care about how the foods they eat are grown and made. Therefore, environmentally sustainable practices are a crucial part of ensuring our brands remain relevant with consumers. At the heart of our sustainability efforts is a desire to create a better tomorrow. We do this by helping communities and families thrive and by enriching the environment.

In 2008, Kellogg committed to reducing our normalized energy usage, greenhouse gas (GHG) emissions, water usage, and waste to landfill 15-20% by 2015 (from a 2005 baseline). By the end of 2009, we had exceeded the waste to landfill goal (with a 41.5% reduction from the 2005 baseline), so we revised the goal. We plan to decrease waste to landfill by an additional 20% from 2009 to 2015. Through these commitments, we have already delivered Scope 1 and 2 absolute emissions reductions from manufacturing of approximately 12%.[8]

In 2014, Kellogg built on our 2008 sustainability commitments with new goals in two areas: responsible sourcing and natural resource conservation.
Our Global Sustainability Commitments include:

- Reduce energy and GHG emissions by an additional 15% (per metric ton of food produced) by 2020 from our 2015 performance.
- Expand the use of low-carbon energy in our plants by 50% by 2020.
- Implement water reuse projects in 25% of our plants by 2020.
- Reduce our water use by an additional 15% (per metric ton of food produced) by 2020 from our 2015 performance.
- Ensure 30% of our plants send zero waste to landfill by 2016.
- By 2020, we will responsibly source 10 priority ingredients as defined by continuous improvement and direct investment on climate resilience, GHG emission mitigation, fertilizer optimization, water use and water quality and soil health.
- By 2030, support improved livelihoods for over 500,000 farmers, many of whom are women, through partnerships, research and training on climate smart agriculture. We are also committed to supporting 15,000 smallholder farmers.

Kellogg Greenhouse Gas Value Chain Modeling

Kellogg's Carbon Calculation and Forecasting Tool is an Excel model built to aggregate and project the collective carbon emissions from key emissions-generating activities across the value chain: ingredient procurement, inbound ingredient transportation, manufacturing, packaging, and product distribution. The model includes historic data from 2009 to most current, and forecasts future emissions to 2020. This tool has been built by Antea Group as a way for us to understand the impact of the different value chain components and how our changing business will impact our emissions.

[8] Commitment was made in 2008, from a 2005 baseline, and represents a 1.7% - 2% annual reduction.

Operational Boundary

Kellogg's global business is composed of over 60 facilities in four geographies: North America, Latin America, Europe and Middle East, and Asia Pacific. The model includes actual or equitable estimated data for ingredient, inbound transport, manufacturing, packaging, and distribution for all of these locations.

Emissions Boundary

Kellogg's Carbon Calculation and Forecasting Tool quantified emissions in five key areas across the value chain.

- Scope 1, 2 & 3 Manufacturing
- Scope 1 Distribution
- Scope 3 Packaging
- Scope 3 Ingredients
- Scope 3 Inbound Raw Material Transportation

Model Application

Designed as a planning level tool, the model allows for the testing of various sales changes and carbon reduction efforts, and projects these scenarios with business-as-usual expectations to support decision making. These modifications can be made at the company-wide level or narrowed by geography or product type for a more specific perspective. Using this feature, Kellogg can estimate growth or attrition in business units and regions while also estimating the impacts of low-carbon investment.

From this information, Kellogg affirmed that the largest carbon footprint occurs in manufacturing and ingredients, which the 2020 Global Sustainability Commitments already begins to address. Previous work through industry benchmarking had ingredients as larger percent of total emissions (approx. 60%) but through this analysis, it is estimated that ingredients are fewer than 50% of total carbon emitted. Although different than prior assessments, it appropriately indicates that our footprint is smaller than other peer companies because of our plant-based food portfolio, with very limited number of dairy and animal protein ingredients.

By focusing on manufacturing and our ingredient footprint, especially in the United States and growth markets, Kellogg will be able to reduce absolute greenhouse gas emissions. Additional work will be done to assess how the INDC in our key markets will help to deliver additional emission reductions beyond our own efforts. External Methodologies and Tools

As summarized in the context section above, Kellogg used the IPCC framework and data to establish a starting point for science-based reductions. The result of this assessment was then tested through two additional tools created by trusted third parties: Sectoral Decarbonization Approach and the 3% Solution.

Sectoral Decarbonization Approach

The Sectoral Decarbonization Approach (SDA) is a freely available open-source methodology that allows companies to set emission reduction targets in line with a 2°C decarbonization scenario. It is based on the 2°C scenario (2DS) developed by the International Energy Agency (IEA) as part of its publication, Energy Technology Perspectives 2014 (IEA, 2014). The methodology was developed by CDP, WRI and WWF with the technical support of Ecofys, the consultancy partner. The methodology includes input from a group of technical advisors, two public stakeholder workshops and one online workshop, and aims to provide businesses with a convenient and research-backed way to set their emissions goals. It is currently available in draft stage and the final version that incorporates feedback from a public stakeholder consultation will be published in 2015.[9]

Kellogg used this tool, and its flexible baseline and timeline, to calculate SDA science-based targets. The SDA Draft Tool calculator[10] evaluates Scope 1 and 2 separately, as well as electricity usage data. Kellogg input historic and publically available data into the tool. Kellogg is considered part of the "Other Industry" sector (the tool does not segregate within this sector) and the targets are therefore more aggressive than with other calculators because food companies are compared to other industries, including nonferrous metal manufacuturing, electronics, and the construction industry. Also unlike other calculators, the tool shows a cumulative optimal reduction rather than an annual reduction (a commonly used metric for internal company communication).

The table (Table 1) below shows a summary of the SDA Draft Tool outputs, based on Kellogg Company data. From this calculation, a 74% Scope 1 and 2 emissions reduction is recommended by 2050.

Table 1. SDA Draft Tool Analysis

Base year 2015		Target year 2050
561,409 tCO2 scope 1 emissions	-48%→	265,431 tCO2 scope 1 emissions
801,682 tCO2 scope 2 emissions	-92%→	65,165 tCO2 scope 2 emissions
1,361,478 MWh electricity use		
1,363,091 tCO2 scope 1+2 emissions	-74%→	330,596 tCO2 scope 1+2 emissions

[9] http://sciencebasedtargets.org/methods/
[10] http://sciencebasedtargets.org/tools/

3% Solution

The 3% Solution identifies how US-based corporations can set GHG reduction targets that lead to a collective cost-savings of $780 Billion USD between 2010 and 2020, while aligning targets with IPCC's 2°C pathway. Developed by WWF with CDP, McKinsey & Company, and Point380, these savings are achieved by boosting energy-efficiency measures and transitioning to low-carbon energy sources. The US corporate sector would cut carbon emissions by 3% annually on average, though the methodology can provide guidance at a company level using a simple tool called the The Carbon Target Profit Calculator.

The Carbon Target and Profit Calculator is a tool to help individual companies set a 2020 carbon reduction target and determine potential cost savings if those reductions are achieved. The calculator translates The 3% Solution report's U.S. economy-wide savings down to an individual company level, taking into account sector-specific opportunities.[11] The tool is constrained to a 2010 baseline and a 2020 target, which is not aligned with the IPCC 2050 horizon or the Kellogg Company baseline of 2015.

Kellogg Company entered Scope 1 and 2 emissions data from 2010 into the Carbon Target and Profit Calculator. This tool uses a different sector-based approach than the SDA Draft Tool and therefore Kellogg falls into a different category – consumer staples. The tool calculates both total and annual targets.

The table below (Table 2) shows a summary of the Carbon Target and Profit Calculator outputs, based on Kellogg Company data. Since Kellogg Company baseline is 2015 with a target year of 2050 (more aggressive than IPCC's 2010 baseline), average annual percent emissions reduction from the Carbon Target and Profit Calculator were extrapolated to align to these parameters. Based on this calculation, a 56% Scope 1 and 2 emissions reduction is recommended by 2050.

Table 2. Carbon Target and Profit Calculator Analysis

Emission Baseline for 2010	1,343,409 tCO2e Scope 1 + 2
Emission Target for 2020	1,075,582 tCO2e Scope 1 + 2
Absolute Emissions Reduction	287,509 tCO2e
Total Percentage Emissions Reduction (from 2010-2020)	20-21%
Average Annual Percentage Emissions Reduction	1.5 - 1.6%
From 2015 Baseline to 2050 Target Based on Emission Reduction Estimate	52.6 – 56%

Conclusion

Kellogg Company assessed science-based targets for Scope 1, 2, and 3. Three independent methodologies were used, to align with current science: Intergovernmental Panel on Climate Change, Sectoral Decarbonization Approach, and the 3% Solution. Results from this analysis are as follows:

Table 3. Kellogg Analysis Summary

[11] http://sciencebasedtargets.org/methods/

Methodology/Tool	Baseline	2050 Target
IPCC	2010	65% Reduction Scope 1 + 2
Sectoral Decarbonization Approach (Draft Tool)	2015	74% Reduction Scope 1 + 2
3% Solution (Carbon Target and Profit Calculator)	2015	52 – 56% Reduction Scope 1 + 2
Kellogg Final Commitment	2015	65% Reduction Scope 1 + 2 50% Reduction Scope 3

By working with multiple methodologies, Kellogg Company was able to address the gaps in each tool and adapt it to the unique product mix, footprint and scale of Kellogg.

Neither the SDA Draft Tool nor the Carbon Target and Profit Calculator properly account for Scope 3 emissions, especially those from the agriculture industry at this time. Based on these limitations, Kellogg will align the Scope 3 greenhouse gas emission target to the 1.5% annual reductions for the consumer staple industry as recommended by the 3% Solution. Kellogg looks forward to the Sector Decarbonization Tool's final version and working with industry partners and NGOs to develop the "Agriculture" sector that will help identify specific reduction targets for Scope 3 including from food waste and land use change (deforestation and peatland drainage). Kellogg will continue to partner with key stakeholders to build tools, supplier resources and delivering continuous improvement as this work progresses.

Implementation Roadmap

It is important to acknowledge that these commitments are made recognizing the interconnected and inter-reliant nature of the business with suppliers, farmers, customers, consumers and governments. The execution of government commitments, including Independent Nationally Determined Contributions (INDCs), will enable and support the execution of Kellogg's commitments. That is why Kellogg, as part of BICEP, has advocated for policies like the United States' Clean Power Plan. We know, however that INDCs, will not be enough alone. Kellogg has decided to look beyond the short-term framework of most of these provisions and self-impose a "ratchet" to 2050, aligned with the IPCC guidance to limit global warming to 2°C above pre-industrial levels.

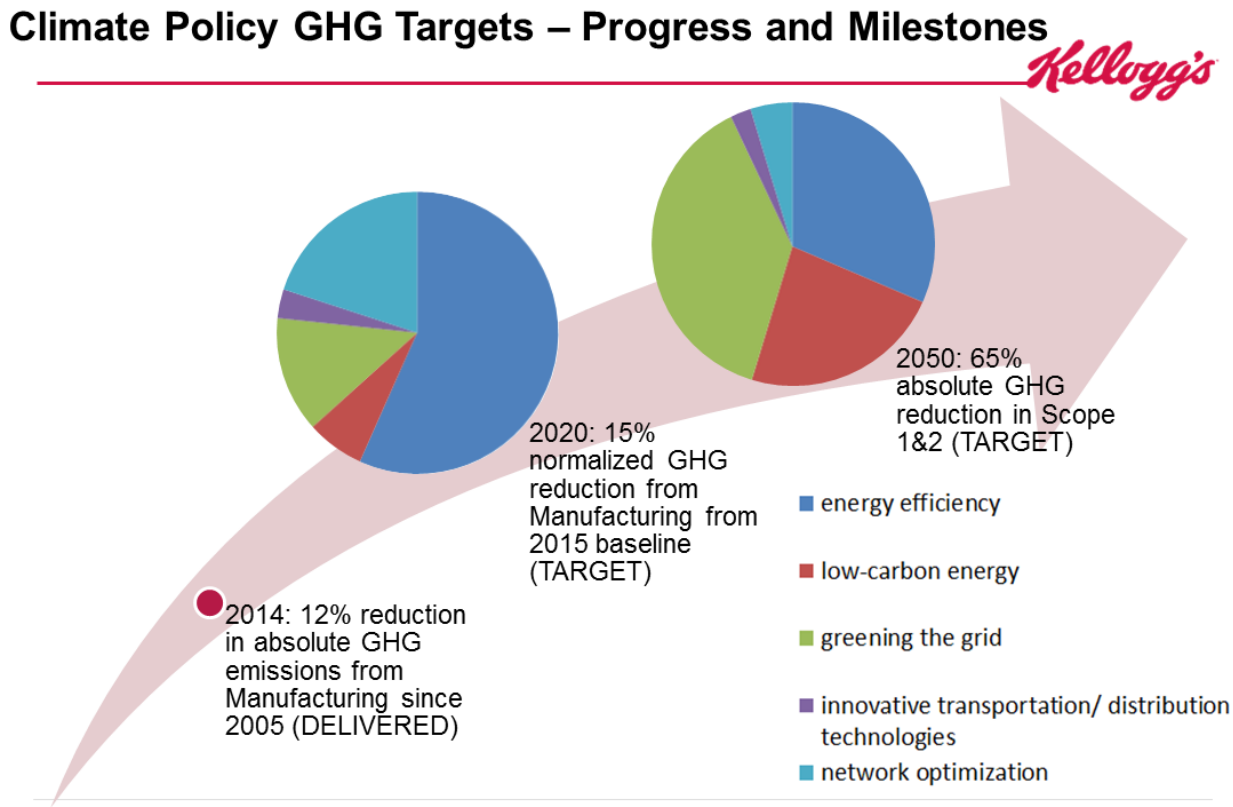
Kellogg's commitment to deliver a Scope 1 and 2 target of 65% reduction and Scope 3 target of 50% reduction by 2050 must be coordinated and executed across national and geographic boundaries, in over 20 countries of the world, and across suppliers with varying levels of resourcing and expertise. Kellogg is creating a detailed glide path to enable and track execution with key milestones. Kellogg will report our progress annually and reevaluate the targets and the tools, technologies and sciences that deliver them every 5 years at a minimum, as well as a reevaluation and re-establishment of the targets, with the tools, technologies and sciences that deliver them.

Between now and 2020, Kellogg will continue to drive energy efficiency and the implementation of low-carbon technologies through the execution of the 2020 Global Sustainability Commitments. This will deliver a 15% normalized GHG reduction and drive annual absolute reductions in our manufacturing,

both of which will be reported annually. New absolute targets will be set for warehouse, office and distribution emissions, while establishing improved tracking mechanisms.

Below is a graphic (Figure 1) representation of the tools and technologies we intend to use to deliver our Scope 1 & 2 GHG reductions. We know that during the early stages of our journey, we will rely heavily on energy efficiency and that we are working to optimize our manufacturing and distribution, with specific targets to double our emerging markets, between now and 2020. As we progress towards 2050, we will rely more on improvements in grid technology and assume that countries will deliver and go beyond the existing INDC commitments. Kellogg will continue to develop partnerships to expand our use of onsite and offsite low-carbon energy generation.

Figure 1. Climate Policy GHG Targets



Kellogg Company will continue to support the execution of the Scope 1 & 2 goals through the following tools and strategies:

- Continue to use a reduced internal rate of return for sustainability capital projects
- Increase the use of facility metering, project monitoring and verification, and alternative financing structures, such as PPA and lease.
- Increase the use of onsite low carbon energy sources and Innovative transportation technologies, like CNG and electric vehicles
- Continue to use best practice sharing, training, and recognition
- Continue and expand the use of strategic partnership for technical and funding assistance, such as the US Department of Energy and local utility companies.

Kellogg will target a Scope 3 GHG reduction of 20% by 2030. Kellogg will engage all suppliers in the following ways:

- Continue and expand CDP Supply Chain participation, engagement and education
- Continue supplier education through video training, best practice sharing, and communication
- Embed CDP Supply Chain submittal into supplier expectations
- Acknowledgeexcellence through supplier awards and recognition (including through www.OpenForBreakfast.com)

A baseline will be set for our Scope 3 emissions from tier 1 suppliers, including our agricultural emissions, in 2015. This baseline may adjust over time according to the GHG Protocol and the changing supplier base. When we are measuring GHG emissions and reductions in our priority ingredients, as outlined in our 2020 Global Sustainability Commitments. The calculations will be based off of actual reported yields for engaged growers and combined with emission estimates from academic studies for that crop. Farmer measurement tools, like the Cool Farm Tool, will also be deployed to capture specific emissions from rice production, nitrogen fertilizer application, and on-farm energy use.

To find opportunities for reducing GHG emissions in our agricultural supply chain, Kellogg will continue to engage in collaborative initiatives with growers, suppliers and external partners to encourage agricultural sustainability on farm. These include Field to Market, Sustainable Agricultural Initiative Platform, Cool Farm Alliance, AIM-Progress, International Rice Research Institute (IRRI), International Maize and Wheat Improvement Center (CIMMYT) and others. We will continue our work to measure and reduce food waste from post-harvest loss through the value chain to our own manufacturing, through the WRI Food Waste and Lost Standard.