The appliance of science

Karthik Suresh, committee member for UKAEE and director at Ameresco, highlights the growing development of science-based targets in reducing greenhouse gas emissions. Can this cause a ripple effect in driving wider emissions reductions in the supply chain?

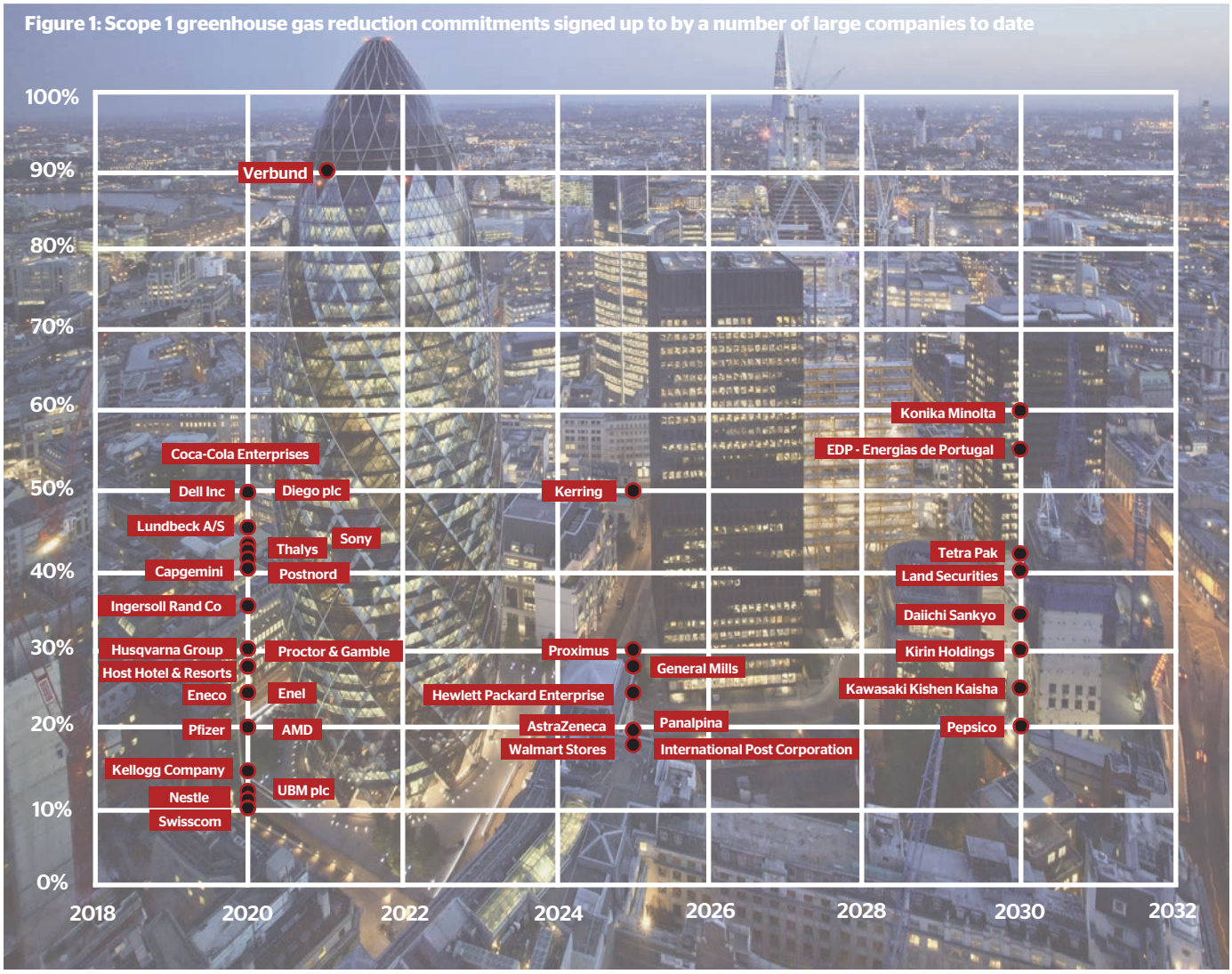
The corporate sector is the world's largest source of emissions, and larger companies are coming under pressure and scrutiny from customers, investors and employees to do more about their carbon footprint. As a result, an increasing number of companies are setting science-based targets to reduce greenhouse gas emissions, signing up to the Science Based Targets initiative set up by the WWF, the World Resources Institute, the UN Global Compact and CDP.

The term 'science' in the name of the initiative has a very precise meaning. The group defines science-based targets as targets adopted by companies to reduce greenhouse gas (GHG) emissions "that are in line with the level of decarbonisation required to keep global temperature increase below 2°C compared to pre-industrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR5)".

Some 230 companies have signed up to the initiative, with 41 having set targets so far covering Scope 1, Scope 2 and Scope 3 emissions. Scope 1 emissions result from sources controlled by the organisation, such as generation or process equipment. Scope 2 emissions result from indirect emissions, for example from purchased energy and Scope 3 emissions result from activities such as commuting that are related to the organisation but not directly controlled or owned by it.

Companies participating in the initiative are required to »

Figure 1: Scope 1 greenhouse gas reduction commitments signed up to by a number of large companies to date



set a target for the percentage of emissions reduction they will make by a target year against a base year.

Scope 1 emissions are those that companies have the greatest ability to influence by changing the way in which they operate or carry out their business. Figure 1 shows the commitments that some of the companies in the initiative have signed up to so far for reducing Scope 1 emissions.

The bulk of companies have set targets for reductions in emissions ranging from 10% to 60% to be achieved between 2020 and 2030. One outlier, Verbund, has set itself a target of 90% reductions in Scope 1, 2 and 3 by 2021 but it is Austria's largest electricity provider and generates 90% of its electricity from hydro power.

Many companies have set targets that at first glance seem quite challenging. Reductions of 10-50% of direct emissions in three years are going to require taking a radical approach to every aspect of company operations. In particular, it will require implementing a number of energy conservation measures as soon as possible. Vilnis Vesma, a well-known figure in the energy industry, says "the challenge (and opportunity) relates to rational target-setting at the micro rather than macro level", pointing out that the scientific approach needs to be followed through to the detail of implementation.

The initiative, however, allows companies a little more flexibility as targets can be absolute or relative. For example, AMD has an absolute goal for suppliers' wafer foundry scope 1 emissions to stay 30% below the Semiconductor Industry Association average while Thalys' commitment is to reduce corporate Scope 1, 2 and 3 GHG emissions per passenger kilometre by 41.4% by 2020. Autodesk commits to reduce total Scope 1, 2, and 3 emissions 43% by 2020, while Ingersoll Rand commits to reduce scope 1 and 2 emissions (on a per unit revenue basis) 35% by 2020. The headline reduction figures cannot be compared directly as a result.

Companies can choose a method that works for them and drives the right kind of emissions reductions in their business. To help them there are seven methods put forward by the science-based targets group so far:

1. The Sectoral Decarbonisation Approach (SDA)
The SDA looks at how similar energy intensive companies can choose the lowest cost technology mix to meet their energy demand. The SDA looks at how sectors differ from each other, the potential for reductions and how quickly each sector grows over time.

2. The 3% solution
Developed by McKinsey, WWF, CDP and Point 380, US corporates would cut emissions by 3% per year overall, while individual corporates would have tailored targets using a tool called the Carbon Target Profit Calculator.

3. BT – CSI
BT has come up with a Carbon Stabilisation Intensity (CSI) target in 2008 that is calculated by comparing its emissions with how much it as a corporation contributes to GDP.

The contribution to GDP is defined as "value-added", and the CSI is measured as the emissions per unit of value added.

4. C-FACT
Corporate Finance Approach to Climate-Stabilising Targets (C-FACT) is a relative target that divides a company's greenhouse gas emissions footprint by its GDP contribution (measured by gross profit) and calculates a carbon intensity reduction rate that takes into account growth rate.

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5. CSO's context-based carbon metric
The Center for Sustainable Organisation's (CSO) developed a context-based carbon metric along with Ben & Jerry's in 2006. The metric compares emissions from an organisation to targets based on climate change mitigation scenarios. It works out an individual target that looks at how the organisation will grow and is updated based on what others are doing and the change in global emissions over time.

6. Greenhouse gas emissions per unit of value added (Geva)
The Geva analysis suggests reducing greenhouse gases per unit of GDP by 5% a year to meet the two-degree target, which then translates into a corporate target of 5% reduction in Geva per year. This seems similar in form to the BT-CSI at first glance.

7. MARS Method
The MARS method targets Scope 1 and Scope 2 emissions, where it has direct control and selects to "over-deliver" on targets on these emissions by targeting a reduction of 100% in 2040 rather than 80% in 2050. This takes pressure off Scope 3 emissions that cover agriculture and are harder to influence.

The one method missing from the Science Based Targets initiative is the system of carbon budgets in the UK. The third carbon budget sets a target reduction of 35% by 2020.

Companies operating in the UK should consider whether they should align their targets with UK policy or a global initiative – and to a large extent this will depend on whether their emissions are created in the UK or internationally.

The Science Based Targets initiative is a significant step in the right direction with commitment from some major companies. Implementation by some of the largest companies in the world will cause a ripple effect through their supply chains and reduce emissions far beyond their own companies. te