Landsec – Science-Based Carbon Reduction Targets

Methodology Report

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This report is submitted by the Carbon Trust for Landsec.

Executive Summary

Landsec has commissioned the Carbon Trust to support the development of science-based carbon reduction targets for its 'Like-for-Like' portfolio for the years 2020, 2030, 2040, and 2050, against a 2014 baseline.

The targets were developed using the Sectoral Decarbonisation Approach methodology and are aligned with the carbon reductions required in the Services/Commercial Buildings sector in the International Energy Agency's 2°C Scenario to limit average global warming to 2°C. The target reductions were calculated based on Landsec's 2014 GHG Inventory and cover its Scope 1&2 emissions, as well as Scope 3 emissions from 'Downstream leased assets'.

The targets have been aligned with the GHG Protocol Scope 2 Guidance and have been calculated for location-based as well as market-based approaches.

Based on the available information, the Carbon Trust believes that using the location-based approach, carbon intensity reduction targets exceeding 9% by 2020, 39% by 2030, 71% by 2040, and 79% by 2050, constitute accurate science-based targets.

1. Introduction

Land Securities Group plc (Landsec) is the largest commercial property development and investment company in the UK. In order to align its long-term strategy with the global commitment to limit average global warming to 2°C, Landsec has decided to set science-based carbon reduction targets for its own operations for the years 2020, 2030, 2040, and 2050.

Landsec has commissioned the Carbon Trust to support the development of its science-based carbon reduction targets and to verify the validity of the methodology applied. This methodology report describes how the Sectoral Decarbonisation Approach (SDA) was applied to calculate Landsec's science-based carbon reduction targets, discusses the operational and organisational boundaries to which these targets apply, and sets out the key assumptions that were made in the calculation process. Finally, it sets out Landsec's carbon reduction targets for 2020, 2030, 2040, and 2050.

2. The Sectoral Decarbonisation Approach (SDA)

2.1. The Methodology

Carbon reduction targets are considered science-based if they are in line with the level of decarbonisation required to keep the average global temperature increase below 2°C compared to pre-industrial temperatures, as described in the Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC). The international Science Based Targets Initiative[1] has reviewed several methodologies for the

[1] The Science Based Targets initiative is a collaborative organisation initiated by CDP, the United Nations Global Compact, the World Resources Institute (WRI), and the World Wide Fund for Nature, promoting the use of science-based targets.

calculation of science-based targets (SBTs)[2]. Landsec has elected to apply the Sectoral Decarbonisation Approach (SDA) for the calculation of its SBTs, a methodology that has been developed by the Science Based Targets Initiative over the past two years.

The Sectoral Decarbonisation Approach (SDA) is a methodology[3] that allows organisations to calculate science-based carbon reduction targets while taking into account the particular differences in economic growth and emission reduction potential across different economic sectors. The SDA follows the decarbonisation pathway of the International Energy Agency's 2°C Scenario (IEA 2DS)[4]. In alignment with the IPCC's RCP 2.6 scenario, the IEA 2DS describes a global emissions trajectory that recent climate science research indicates would give an 80% chance of limiting the average global temperature increase to 2°C, and allocates a respective global carbon budget for every year up to 2050 to individual sectors and sub-sectors. The allocation takes into account inherent differences among sectors, including mitigation potential and cost, and how fast each sector can grow relative to economic and population growth. The carbon budget for each sector is a combination of two elements: 1) the emissions from direct combustion of fuel in the sector (Scope 1

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[2] The *Science-based Target Setting Manual* by the Science Based Targets initiative gives an overview of the methodologies available to companies and outlines a method selection process.

[3] The methodological minutiae and detailed calculation formulas of the SDA are explained in-depth in the Science Based Targets initiative's guide to the Sectoral Decarbonisation Approach

[4] The IEA 2DS is part of the IEA's annual peer-reviewed publication '*Energy Technology Perspectives'*. The scenarios for sectoral activity and carbon budgets used in the SDA are based on the data contained in the '*Energy Technology Perspectives 2014 - Harnessing Electricity's Potential*' edition.

emissions), and 2) the sector's share of emissions from the power sector based on the amount of electricity consumed (Scope 2 emissions[5]).

In addition to an annual carbon budget, the IEA 2DS also includes projections for total sector activity in any given year. Depending how comparable the output of a sector is, the activity indicator can be expressed in a physical metric (for example tons of steel produced), or a financial metric ($ of value added[6]). By dividing the carbon budget for a given year by the total sector activity in that year, the SDA

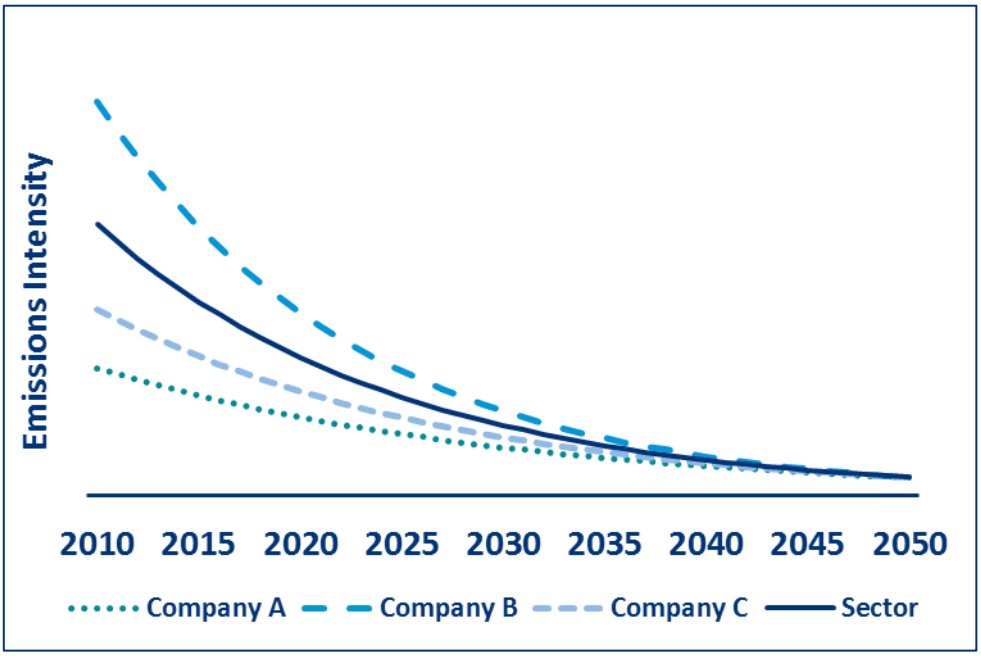

Figure 1 Convergence of carbon intensities in sector under SDA

[5] Scope 2 emissions can be calculated in two different ways: 1) a location-based approach applies an emission factor to the consumed electricity that is based on the geography of the electricity consumption. This means, for example, that all grid electricity in the UK is accounted for with an identical grid emission factor. 2) A market-based approach applies an emission factor to electricity that is specific to the consumer and reflects the fuel mix in the generation of the consumed electricity. Further details on the distinction between these approaches can be found in the GHG Protocol's Scope 2 Guidance.

[6] Where Value Added (VA) = Revenue - Costs of purchased goods and services

calculates a sector intensity pathway up to 2050. The SDA aims for the carbon intensity of all companies in a given sector to converge by 2050 to meet the carbon intensity required to limit global warming to 2°C (see Figure 1). This means every company's intensity pathway will be slightly different, depending their respective Scope 1 and Scope 2 carbon intensities relative to the sector's intensities in the base year, and their expected growth compared to the sector's growth.

2.2. The Calculation

A company's Scope 1 and Scope 2 target emission intensity should be calculated separately and then aggregated for an overall target carbon intensity. The Scope 1 or 2 intensity for a given target year Y is calculated based on four factors:

1. **The carbon intensity of the sector in 2050 (SCI_{2050})** is the 2050 target intensity for all companies in the sector. SCI_{2050} is calculated by dividing the sector's carbon budget in 2050 by the projected sector activity in 2050.
2. **The company carbon intensity reduction required by 2050 (CIR_{2050})** is the specific improvement in carbon intensity a given company has to achieve by 2050. CIR2050 is calculated by subtracting the SCI_{2050} from company's carbon intensity in the base year.
3. **The decarbonisation index of the sector in the target year (DI_Y)** dictates the pace at which the sector should decarbonise to align with the emission pathway. The lower the decarbonisation index, the greater the requirement for intensity reductions. DI_Y is the ratio of the carbon intensity gap to SCI_{2050} in the target year, and the carbon intensity gap to SCI_{2050} in the base year.
4. **The company's market share parameter in the target year (MS_Y)** reflects the difference in activity growth of the company and activity growth in the sector. A company's requirement for decarbonisation increases with increasing market share. The MS_Y is the ratio of the company's market share in the base year and the company's market share in the target year.

Based on these factors, the target carbon intensity for each year, TCI_Y, is calculated by:

$$TCI_Y = SCI_{2050} + (CIR_{2050} \times DI_Y \times MS_Y)$$

Multiplying a company's target carbon intensity in a year with its activity projection calculates the company's total carbon budget for the target year.

A great advantage of the SDA compared to other methodologies is that in enables sector-specific carbon intensity pathways to be applied, making the target more specific to a company's needs and possibilities. One of the sectors defined in the methodology is the Services/Commercial Buildings sector, which makes the methodology highly relevant for Landsec's operations.

2.3. The SDA for the Services/Commercial Buildings Sector

Landsec falls in the Services/Commercial Buildings sector of the SDA, which uses an activity metric of m^2 of floor space. The Services/Commercial Buildings sector includes all activities related to trade, finance, real estate, public administration, health, food and lodging, education and commercial services, i.e. it has a fairly wide scope of sub-sectors and thus energy use patterns. While there can be great variety in the energy and carbon intensity between these sub-sectors, as well as across geographic regions, the SDA currently represents the most specific breakdown of sectoral carbon budgets available in any science-based target methodology and thus represents the best available solution. The overall global combined Scope 1 and 2 carbon intensity of the sector in 2014 was slightly below 83kg CO_2/m^2. The required intensity pathway for this sector is given in Figure 2 below, and shows that combined Scope 1 and 2 emissions are required to drop to around 73 kg CO_2/m^2 by 2020, 59kg CO_2/m^2 by 2025, 44kg CO_2/m^2 by 2030 and slightly over 13kg CO_2/m^2 by 2050. This

equates to a reduction in carbon intensity of 48% by 2030 and 84% by 2050[7] compared to 2014.

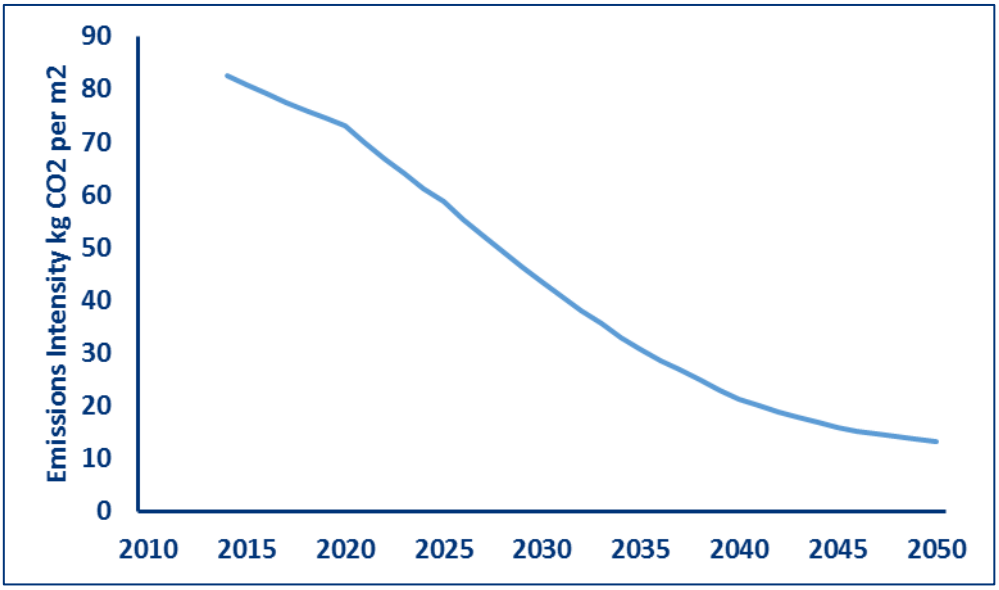

Figure 2- Combined Scope 1 & 2 carbon intensity pathway for Service Buildings sector

3. Landsec's SDA Targets

3.1. Boundaries and Assumptions

3.1.1. Methodology for Calculating Landsec's GHG Inventory

Landsec's greenhouse gas (GHG) inventory was calculated applying the GHG Protocol Corporate Standard[8], the preeminent international standard for company's GHG

[7] The yearly carbon budgets and sector activity projections are based on the data behind the IEA's '*Energy Technology Perspectives 2014 - Harnessing Electricity's Potential*' publication. The pathways were adopted from the publication *Krabbe, O., et al., (2015). Aligning corporate greenhouse-gas emissions targets with climate goals. Nature Clim. Change*, http://dx.doi.org/10.1038/nclimate2770.

[8] GHG Protocol - Corporate Accounting and Reporting Standard

inventories. Furthermore, Landsec's Scope 2 emissions were calculated in line with the GHG Protocol Scope 2 Guidance[9], using location-based as well as market-based emission factors for electricity.

3.1.2. Organisational Boundary

Landsec's operations in the UK are split into two divisions, the London Division, which covers office and small retail space in London, and the Retail Division, which primarily covers large retail space across the UK. Landsec currently reports two GHG inventories, both consolidated using an operational control approach: 1) 'absolute emissions', which covers all its sites, and 2) emissions from sites in the 'Like-for-Like' portfolio. The 'Like-for-Like' portfolio contains sites which have been in Landsec's operations for more than 24 months and thus has not been affected by significant changes such as acquisitions or disposals and allows for more consistent comparison over time.

The baseline for Landsec's science-based carbon reduction targets is the 2014 GHG inventory[10] for its 'Like-for-Like' portfolio, which accounted for 77% of its 2014 'absolute emissions' GHG inventory[11]. This is a common approach in the Commercial Property sector (for example this is used by the Better Buildings Partnership), to ensure progress against targets is measured in a consistent manner.

3.1.3. Operational Boundary

The SDA target setting approach In addition to its Scope 1 and 2 emissions, Landsec also reports against several Scope 3 categories. While the SDA does not generally

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[9] GHG Protocol – Scope 2 Guidance

[10] Landsec's 2014 GHG Inventory covers emissions in the period from April 1st 2013 to March 31st 2014

[11] Using the location-based calculation of the Scope 2 footprint.

cover Scope 3 emissions, emissions from the Scope 3 category 'Downstream leased assets' are included in the Scope 1&2 emission target boundary, as these represent emissions from energy supplied to tenants by the company and could not be separated out from the activity data. Scope 1 emissions from Fugitive Emissions and Vehicles are not included, as the SDA methodology does not account for them. The excluded Scope 1 emissions account for less than 1% of overall emissions, and about 4% of Scope 1 emissions.

3.1.4. Boundary for Activity Metric

The activity metric of m^2 of floor space accounts for all the 'Like-for-Like' floor space in the London Portfolio, as well as the communal areas of the Retail Portfolio and retail units where Landsec supplies all energy consumed in the retail units. This approach is broadly aligned with the approach of the Better Buildings Partnership. Excluded from the metric were the floor space of retail units where the company only provides part of the energy (e.g. through heating/cooling, but not for lighting, etc.), as well as carparks. Nevertheless, all energy controlled by the company for these spaces was included in the footprint. The intensity metric thus represents a conservative estimate.

3.1.5. Greenhouse Gases Considered

The Greenhouse Gas Protocol Corporate Standard requires the inclusion of the seven greenhouse gases covered by the Kyoto Protocol — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), nitrogen trifluoride (NF_3), and sulphur hexafluoride (SF_6). The SDA methodology currently only covers CO_2 emissions, as these are covered by the IEA 2DS scenario. Specifically, this excludes the nitrous oxide and methane elements of Landsec's energy related emissions, which are expressed in CO_2e. However, CO_2 emissions make up well in excess of 99% of Landsec's GHG inventory Emissions from nitrous

oxide and methane were therefore deemed *de minimis* and the reduction target applied to the company's full CO_2e GHG inventory.

3.1.6. Landsec's Activity Growth Assumption

In the absence of in-house mid to long-term projections of activity growth, Landsec has decided to align its assumption on activity growth with the IEA's assumption on sector activity growth in Europe. Therefore, Landsec's activity metric is assumed to grow at a constant compound annual growth rate (CAGR) of 0.66%.

3.2. Reduction Targets

Landsec's emission reduction targets have been calculated for a market-based (Figure 3), as well as a location-based (Figure 4) Scope 2 accounting approach.

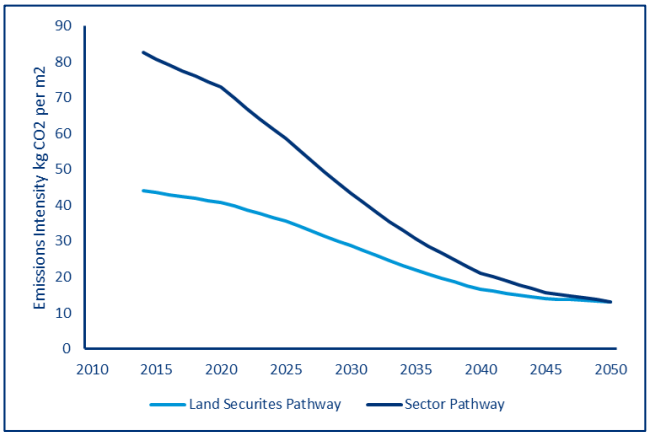

Figure 3 Market-Based Scope 1&2 Intensity Pathway

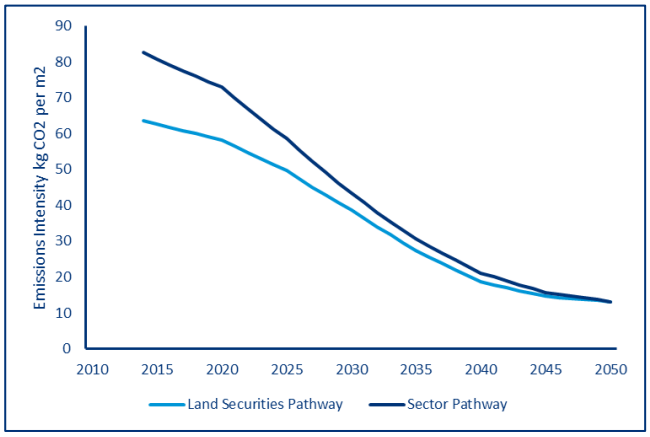

Figure 4 Location-Based Scope 1&2 Intensity Pathway

Reduction targets are slightly lower for the market-based approach, as the electricity Landsec procured in the baseline year has a lower carbon intensity than the UK grid mix. The specific targets are set out in Table 1 below. Landsec's relatively low carbon intensity is driven by two factors: 1) The relatively high level of energy efficiency of commercial property in the UK, compared to the global average, and 2) the prevalence of retail floor space in Landsec's portfolio, which again has relatively low

carbon intensity compared to the average of the sector. Based on the target emission intensities for the individual years running up to the targets years, as well as the projected activity in these years, the Base to Target Year Emission Budget was calculated, which equates to the total, cumulative absolute carbon emissions that Landsec can emit up to the target year without exceeding the limits prescribed by the IEA 2DS emission pathway.

Total 'Like-for-Like' Portfolio	Market-Based				Location-Based			
Company Target Years:	**2020**	**2030**	**2040**	**2050**	**2020**	**2030**	**2040**	**2050**
Intensity Reduction Against Baseline	-8%	-35%	-63%	-70%	-9%	-39%	-71%	-79%
Absolute Reduction Against Baseline	-4%	-28%	-56%	-62%	-5%	-33%	-65%	-74%
Base to Target Year Emission Budget (k tCO2)	413	921	1,259	1,498	592	1,297	1,719	1,970
CAGR Intensity Reduction	-1.3%	-2.6%	-3.7%	-3.3%	-1.5%	-3.1%	-4.6%	-4.3%
CAGR Absolute Reduction	-0.7%	-2.0%	-3.1%	-2.7%	-0.8%	-2.4%	-4.0%	-3.6%

Table 1 Landsec's Emission Reduction Targets against 2014 baseline

3.3. Updating the Targets

It is best practice for science-based targets to be regularly reviewed and updated. Events that should trigger a review include changes to the projections used for the calculation (such as sectoral or company-specific activity growth projections), and changes to the operations that require the recalculation of the base year emissions (e.g. mergers, acquisitions, or divestments). Landsec in particular should monitor the mix of office and retail space in its 'Like-for-Like' portfolio, as this has a significant effect on its overall carbon intensity.

4. Conclusion

The Carbon Trust has worked with Landsec to develop science-based carbon reduction targets based on the Sectoral Decarbonisation Approach. Based on the available information, the Carbon Trust believes that against a 2014 baseline, carbon

intensity reduction targets exceeding 9% by 2020, 39% by 2030, 71% by 2040, and 79% by 2050, constitute accurate science-based targets using the location-based accounting approach.