



# COULD BOOSTING ENERGY PRODUCTIVITY IMPROVE YOUR INVESTMENT PERFORMANCE? TECHNICAL REPORT

FINAL DRAFT

MAY 2016



CALSTRS



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## Introduction

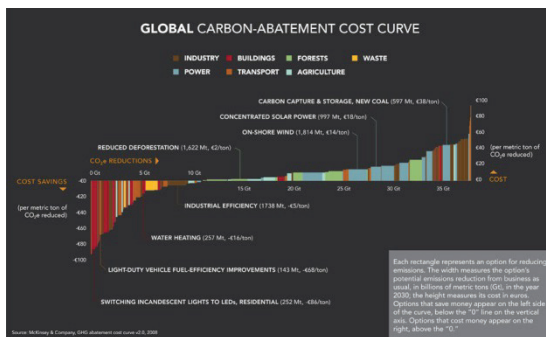
## In depth presentation of guide for investors content

1. What is energy productivity?  
Why is it relevant to investors?
2. Identify sectors where energy productivity is important
3. Identify companies with which to engage. Measure their performance against competitors
4. Steps to engage with companies
5. Tools and resources

This project was initiated by the ClimateWorks Foundation and ClimateWorks Australia



**Real-world,  
practical solutions**



**Positive messages,  
through influential  
actors**



**To influence policy  
& catalyze business  
action**



The project was funded by the ClimateWorks Foundation to support research, analysis and stakeholder engagement.



## This project was completed in partnership with CalSTRS and with strong support from investor groups

The California State Teachers' Retirement System is the largest educator-only pension fund in the world. Understanding the potential for energy productivity improvements to contribute to both the financial growth of investor portfolios and to greenhouse gas emissions reduction, CalSTRS participated as lead investor in the project.

# CALSTRS

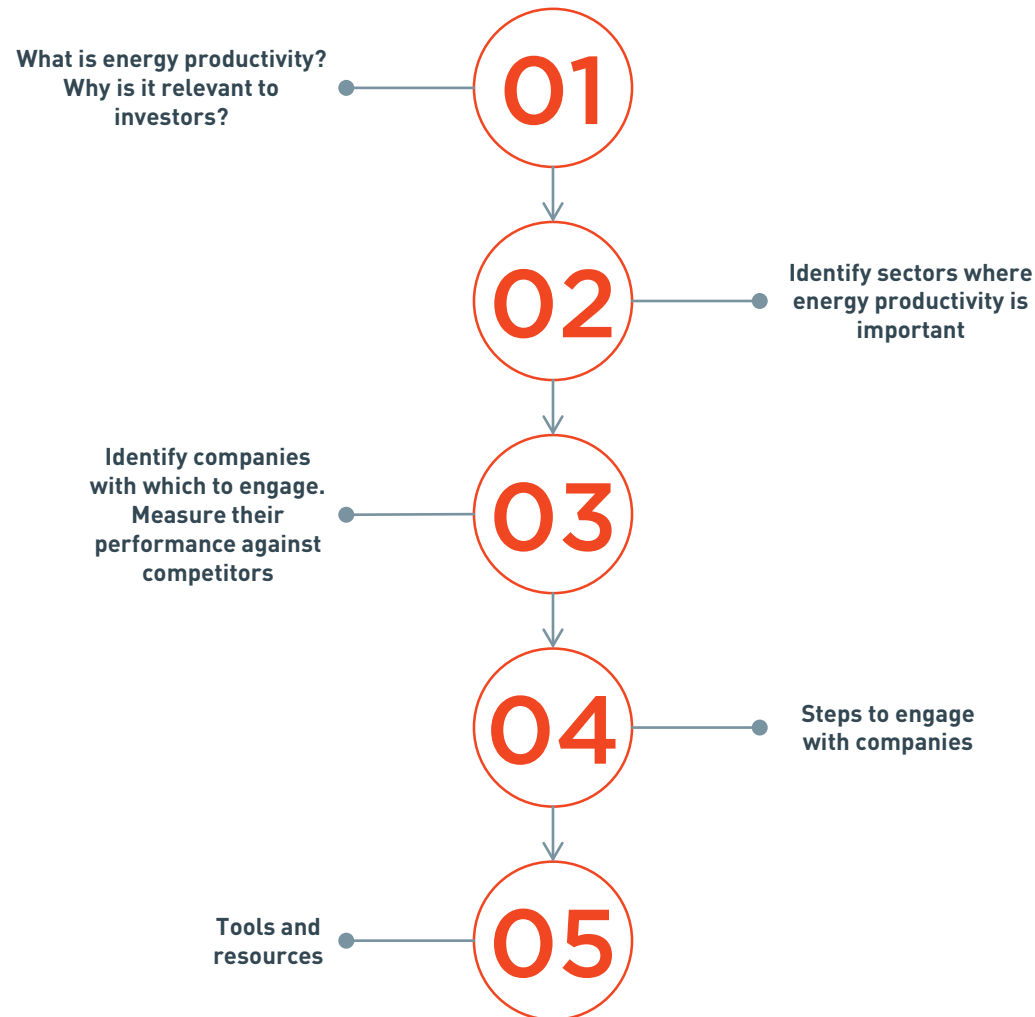
Thanks also to our Steering Committee and those experts who have provided their time and expertise during project scoping, development and review of preliminary results.

We are especially grateful to our project partners for their support in shaping the project as well as engagement activities through their networks.



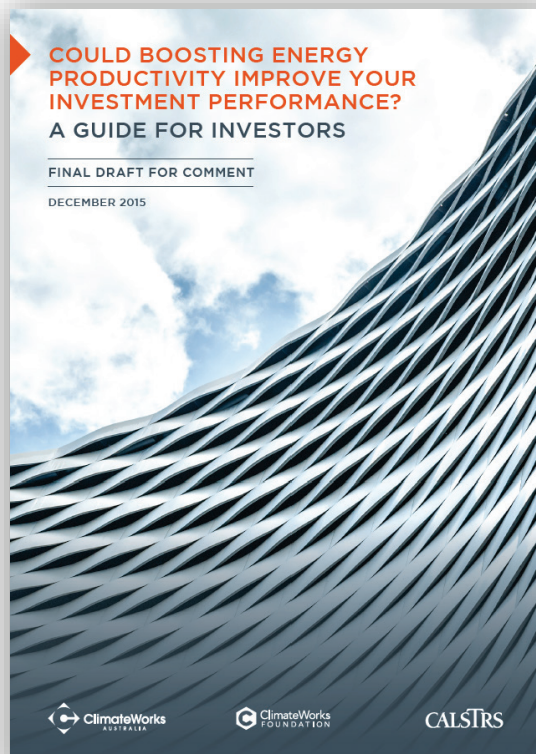
The project aims to support investors in engaging with companies on energy productivity and energy efficiency by guiding them through the process

Contents of guide  
provided to investors



This Technical Report provides additional information on the results and details the methodology, assumptions, and data limitations that apply to the analysis undertaken

It is to be used in conjunction with the guide for investors titled, *Could boosting energy productivity improve your investment performance?*, and the series of six sector summaries for airlines, automobiles, chemicals, construction materials, paper, and steel. **Please click the thumbnails to access each document, or click [here](#).**



AIRLINES



AUTOMOBILES



PAPER



STEEL



CHEMICALS



CONSTRUCTION  
MATERIALS



# In depth presentation of guide for investors content

- 01** **What is energy productivity?**  
Why is it relevant to investors?
- 02** Identify sectors where energy productivity is important
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Energy productivity is most simply described as the amount of economic output per unit of energy input

Production



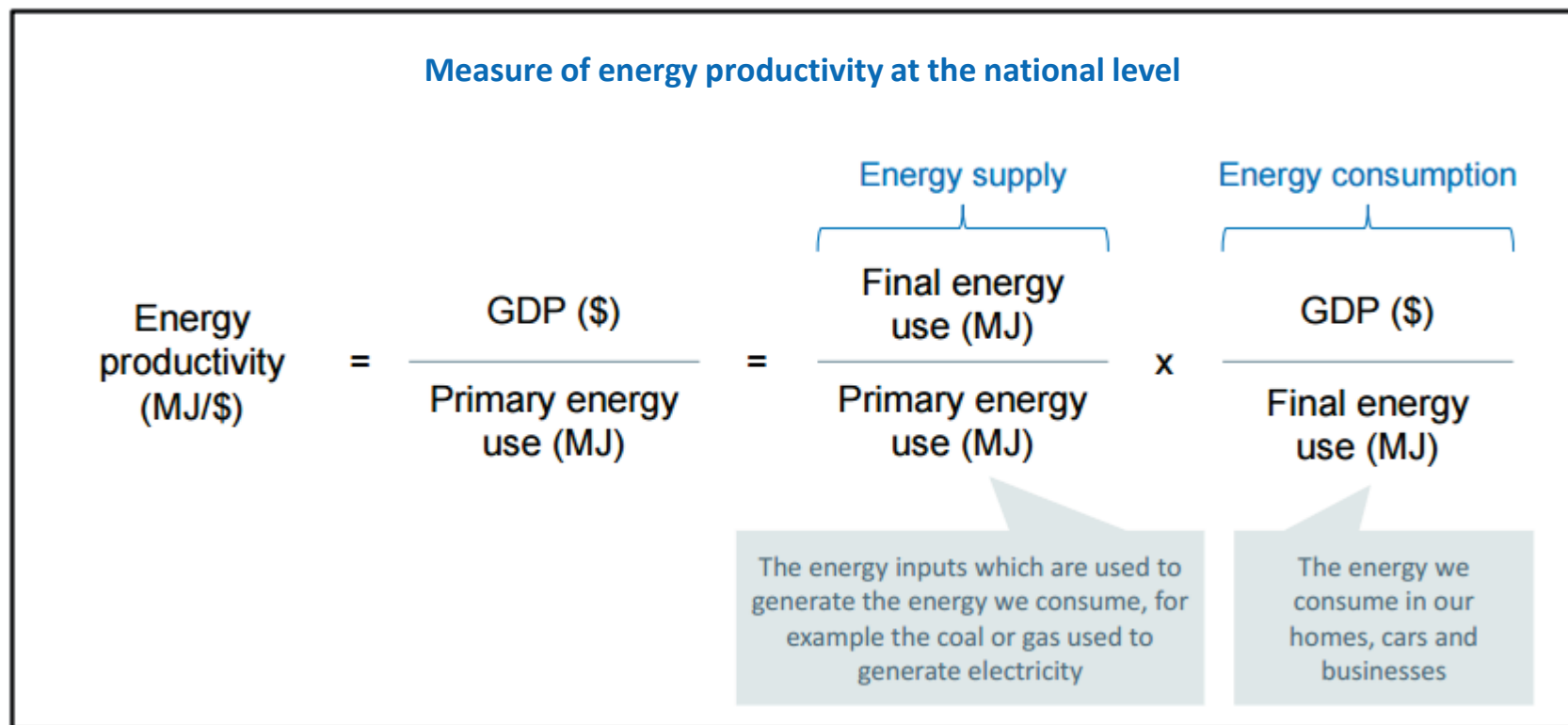
per **1** unit  
of energy used

*Improving energy  
productivity is simply  
about getting more  
value out of the energy  
a company uses.*



## At a national level, this means looking at all energy inputs fueling the economy

**At a national level**, energy productivity is usually measured using primary energy – the total amount embodied in all raw sources of energy used, including energy lost during conversion, distribution and waste – rather than just the amount consumed.



## At a company level, it often focuses on consumption of energy

At a company level, energy productivity can be measured by **revenue generated per gigajoule of final energy used** across all facets of a company's operations. It is indeed rare for companies to report on their primary energy use, most companies only track and report data on their final energy use, or the energy they pay for.

Another way that energy productivity can be measured, and is also used in this analysis for some sectors, is by **units of production per gigajoule of final energy used**. (e.g. tonnes of steel, or number of vehicles).

### Measure of energy productivity at a company level

$$\text{Energy productivity (GJ/\$)} = \frac{\text{Revenue (\$)}}{\text{Final energy use (GJ)}} \quad \text{OR} \quad \frac{\text{Units of production}}{\text{Final energy use (GJ)}}$$

# Many factors influence the energy productivity of a company

## Revenue

Of course, revenue is affected by a whole suite of factors, not all of which are within a company's control, for example changes in:

- Global price of product(s) sold
- Exchange rate of currencies
- Global demand for product

## Energy use

Energy use can be influenced by internal and external factors, and in particular can be controlled and reduced through greater energy efficiency. Energy use will for example generally be lower if:

- Production assets were built/refurbished more recently
- Operations are less vertically integrated (higher use of outsourcing)
- The mix of products is less energy intensive
- The company implements ambitious energy efficiency/productivity plans

## Some of these can be directly controlled by industrial companies to improve their energy productivity

- > **Energy efficiency:** Adopting more efficient technologies and processes and system-wide optimization of energy use.
- > **Electrification:** Shifting to electricity for certain activities, such as electric vehicles, and conveyor belts rather than trucks on mining sites.\*
- > **Structural change:** Shifting operations towards less energy intensive activities or outsourcing some processes, for example to larger scale operators which can achieve greater efficiency.
- > **Energy conversion and distribution:** Switching to more efficient forms of energy generation, for example by switching from grid-supplied fossil fuel-based electricity to distributed renewable electricity.



\* A conveyor uses about 20% of the energy used by a diesel truck to move the same amount of material, although there are other considerations such as additional upfront costs and restrictions on operational flexibility

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For over 70% of companies assessed, analysis indicated significant opportunity to improve energy productivity and compelling evidence of the benefits of doing so

- > **As a component of production, energy is a material cost for companies.**
- > **Improving energy productivity can effectively contribute to reducing climate change risk.**
- > **There is significant potential for financial benefit.**

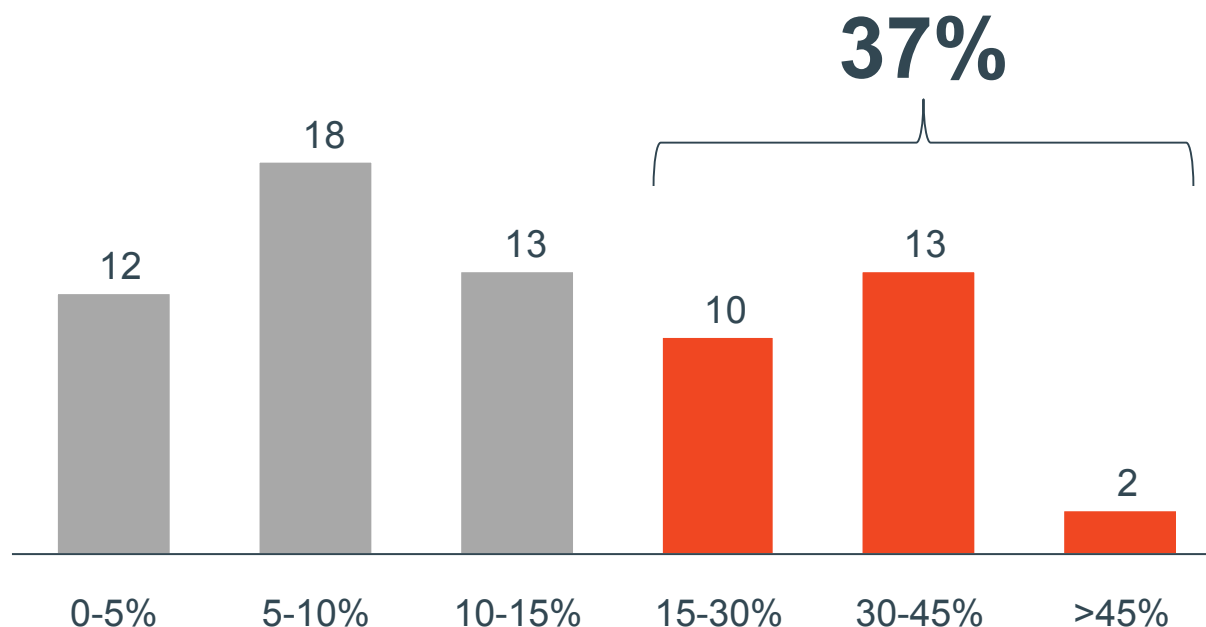
Furthermore,

- > Energy efficiency can deliver multiple benefits.
- > There's increasing pressure from customers and government.
- > Many opportunities are created now through the use of new technologies.

## As a component of production, energy is a material cost for companies

Energy is one of the costs that can be actively managed and many companies are on the bandwagon. Of the companies analyzed for this report, more than a third spent over 15% of their operating expenditure on energy.

25 of 68\* companies spent over 15% of their operating expenditure on energy





## Improving energy productivity can effectively contribute to reducing climate change risk (1/4)

Many investors are now recognizing the long-term investment risks associated with greenhouse gas emissions, climate change and carbon regulation. Reaching net zero carbon emissions during the second half of this century will be required to keep global average temperature rise below 2 degrees Celsius - a benchmark widely regarded as necessary if we are to avert catastrophic impacts of climate change.

Investors are progressing from measuring and understanding climate related risks to taking action to reduce those risks in their portfolio.



*"measure and publicly disclose the carbon footprint of their investment portfolios on an annual basis."*

### GLOBAL INVESTOR STATEMENT ON CLIMATE CHANGE

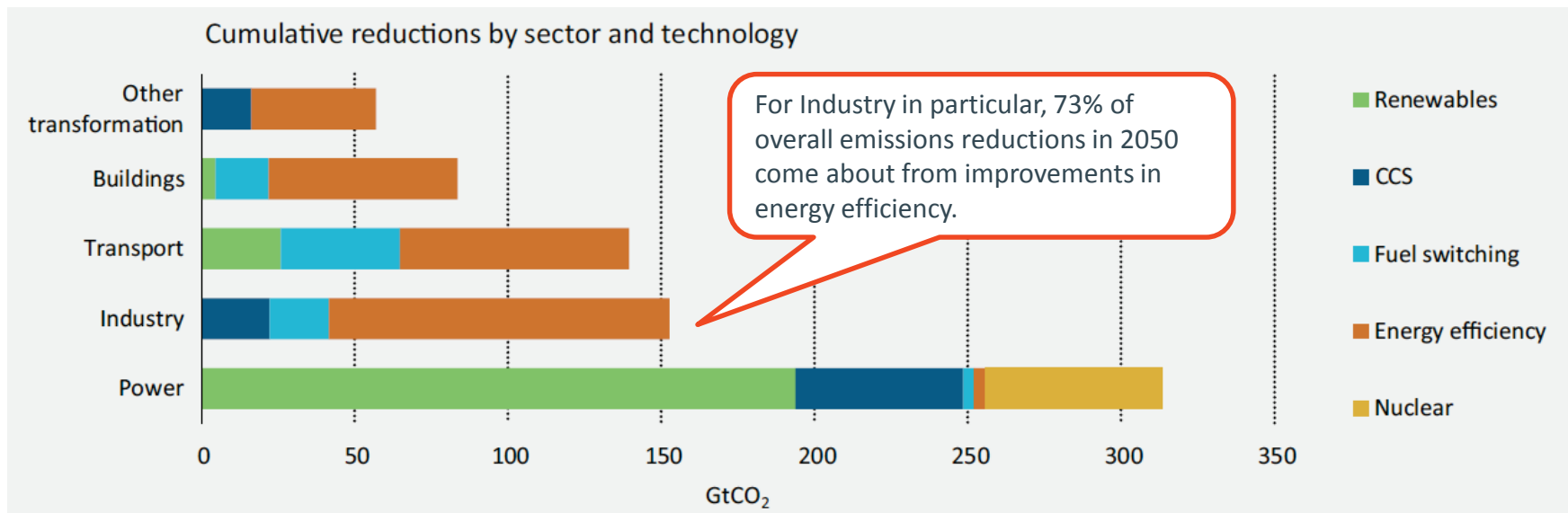


*"sets out the contribution that we as investors can make to increasing low carbon and climate resilient investments."*

*"mobilizing a critical mass of institutional investors committed to gradually decarbonizing their portfolios"*

## Improving energy productivity can effectively contribute to reducing climate change risk (2/4)

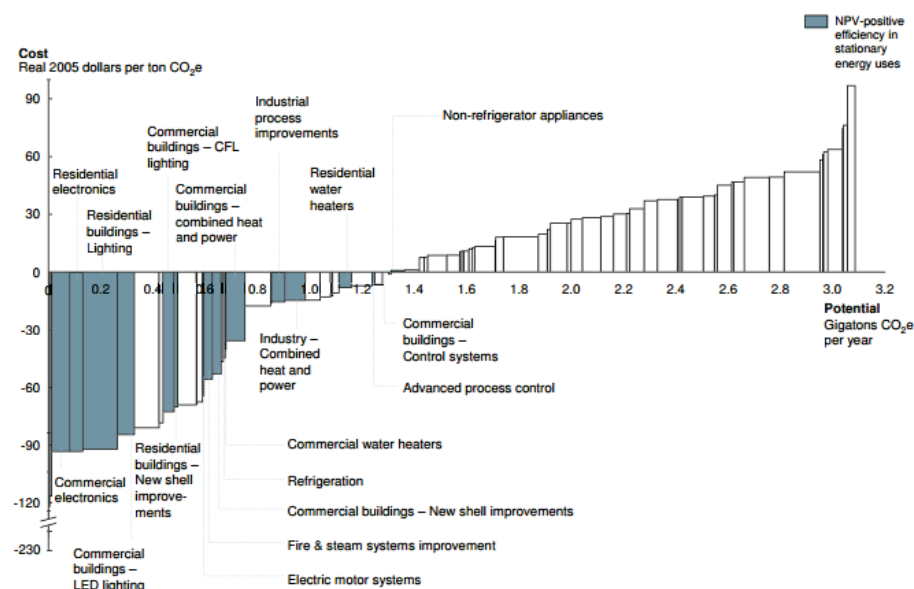
- > Approximately 40% of the emissions reductions required by 2050 to limit global temperature increase to less than 2 degrees Celsius would potentially come from energy efficiency.\*
- > Within different end-use sectors, energy efficiency accounts for 50% to 75% of the cumulative emissions reduction.



Extract of Figure 1.6 *IEA Energy Technology Perspectives 2015* (p. 36)

## Improving energy productivity can effectively contribute to reducing climate change risk (3/4)

- > Improving energy efficiency represents the lowest cost opportunity to reduce emissions
- > Greater energy efficiency could produce a net cost saving of \$1.2-1.6 trillion USD and annual savings of approximately 0.2% of the 2030 global GDP#.
- > By way of example, the U.S. mid-range greenhouse gas abatement cost curve, 2030 (below) shows that energy efficiency could deliver potential emissions reductions of more than 1 billion tonnes of CO<sub>2</sub>e whilst delivering cost savings of over \$1,200 billion in net present value (NPV).

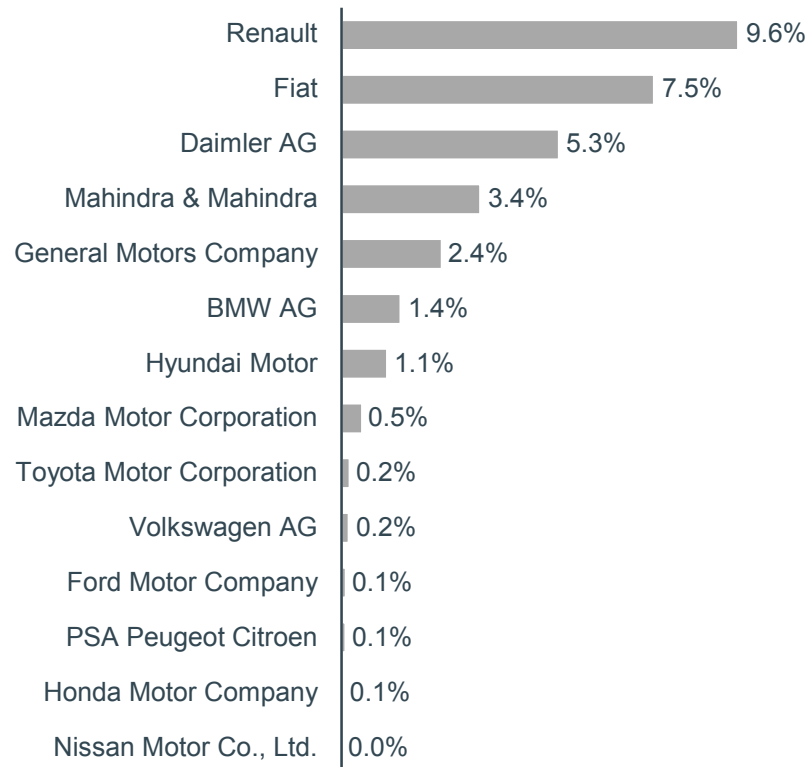


## Improving energy productivity can effectively contribute to reducing climate change risk (4/4)

Energy efficiency opportunities implemented by companies we analyzed resulted in an **average 7 MtCO<sub>2</sub>e annual emissions reduction** over the years 2013 and 2014. This is equivalent to taking over 1.5 million cars off the road for one year.\*

For example, index results showed automobile companies achieving the highest emissions reductions through energy efficiency opportunities implemented in manufacturing facilities, with Renault and Fiat achieving 9.6% and 7.5% per annum emissions reductions respectively, on average over 2013 and 2014.

Annual emissions reduction, % of company gross global scope 1+2 Emissions, 2013-14 average



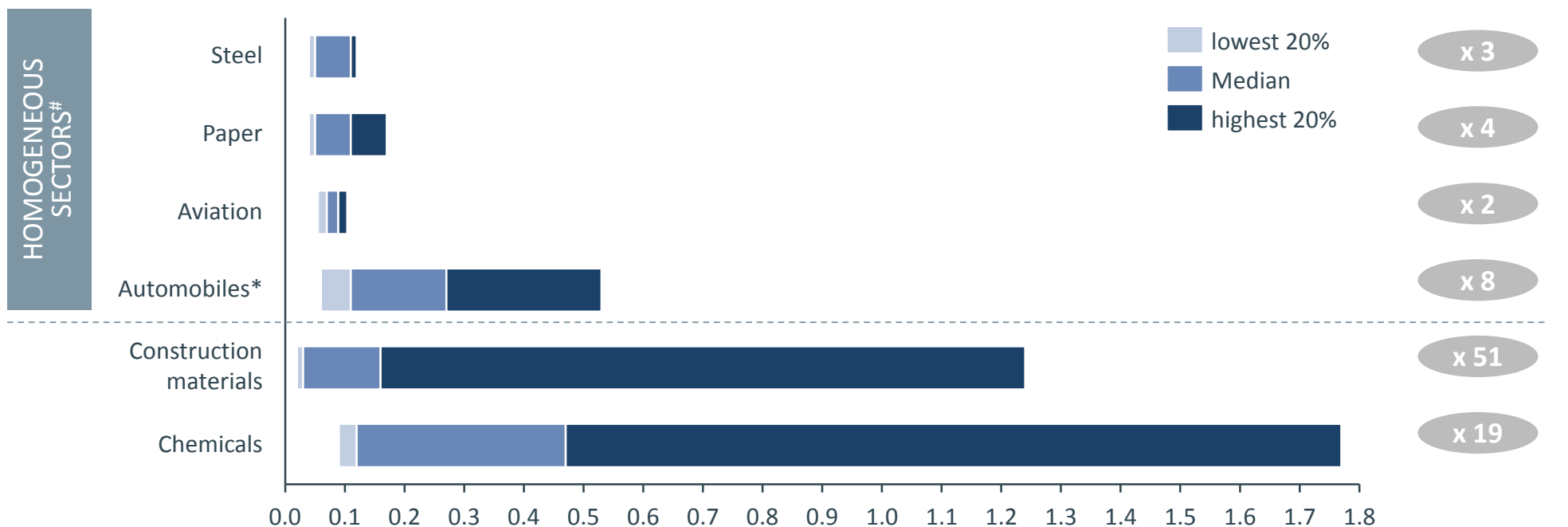
## There is significant potential for financial benefit (1/5)

Even in homogeneous sectors, we found a significant range in energy productivity.

The graph below shows the energy productivity performance of companies in each sector. The lowest and highest performers determine the left- and right-most ends of each bar, with the distribution of companies' energy productivity described by the color segments.

Distribution in energy productivity, \$ revenue per GJ energy use, Latest values

Difference between highest and lowest



\*Automobiles is expressed in units produced per GJ energy use to be of comparable magnitude with other sectors



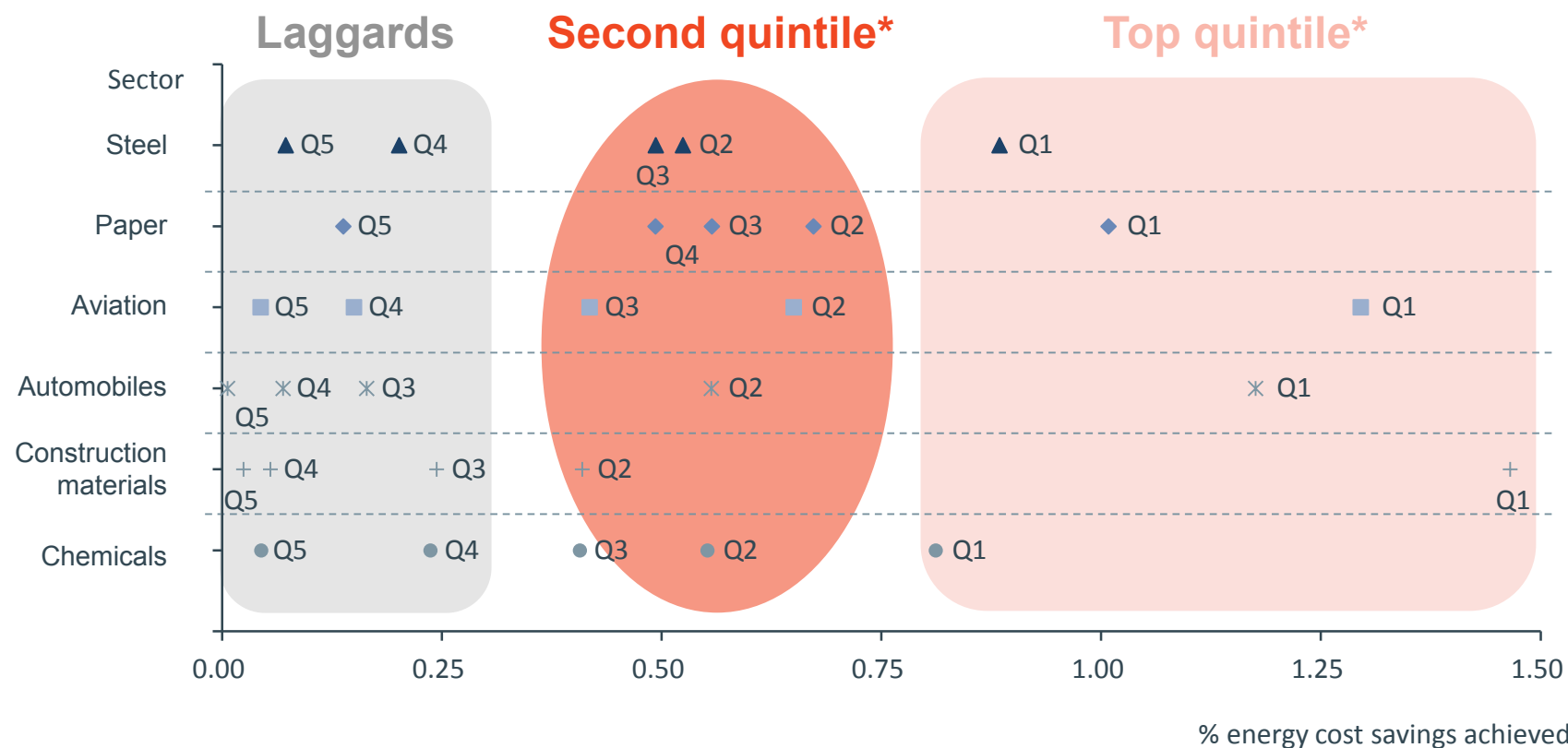
# These sectors are considered homogenous because the companies undertake similar manufacturing processes and produce items of broadly similar value. For a more detailed explanation see the next slide.

## A note on 'homogenous sectors'

- > Sectors are considered homogenous where the companies undertake similar manufacturing processes and produce items of broadly similar value.
- > Homogenous sectors, such as automobiles, have companies that mostly use similar processes in the manufacture of their products and therefore can be more suitably compared.
- > Construction materials and Chemicals are not considered homogenous owing to the range of processes and products produced – e.g. a construction material company may produce only cement, or a combination of cement, plasterboard and bricks that all use different processes and therefore have different energy intensities. Hence the energy productivity of companies in this sector cannot be readily compared directly.
  - > Reflecting this fact, for these sectors the current energy productivity metric is not included in the rating of companies.

## There is significant potential for financial benefit (2/5)

- > We found that leaders consistently report about 1 to 1.5% energy cost savings per year, much more than the rest of the sector
- > In the graph below, companies in each sector are sorted into quintiles based on the energy costs savings achieved from energy efficiency activities.



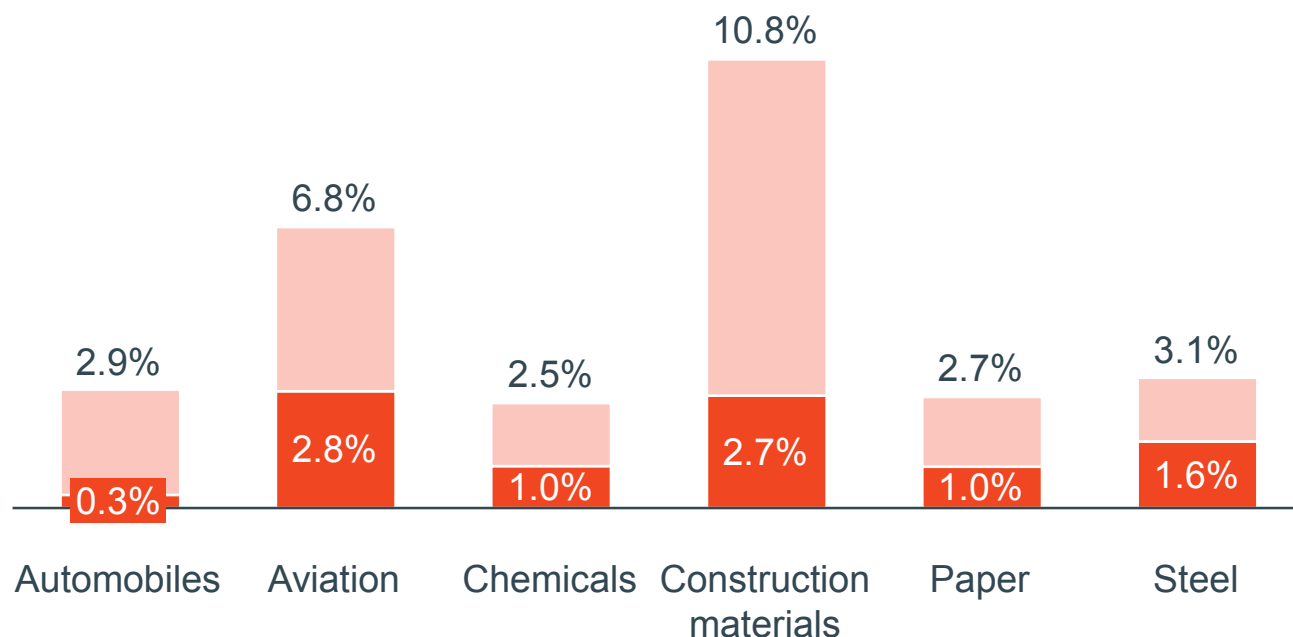
\* Quintiles refer to the 20<sup>th</sup> percentile of companies in each sector, i.e. top quintile refers to the highest 20% of companies in the sector, while second quintile refers to the second highest 20% companies in the sector. Further detail can be found [on this page](#).



## There is significant potential for financial benefit (3/5)

By reducing energy costs and growing efficiencies in line with their best performing peers, industrial companies stand to gain between 2% and 10% growth in annual profits from each year of implementation, as the graph below indicates. These savings would be cumulative over time, so that after 5 years of implementation, they add up to between 10% and 50% growth in profits.

% Profit uplift per annum (50% companies with highest increase)



If lagging companies match:

*Top quintile (20%)*

*+ 2 to 10% p.a.*

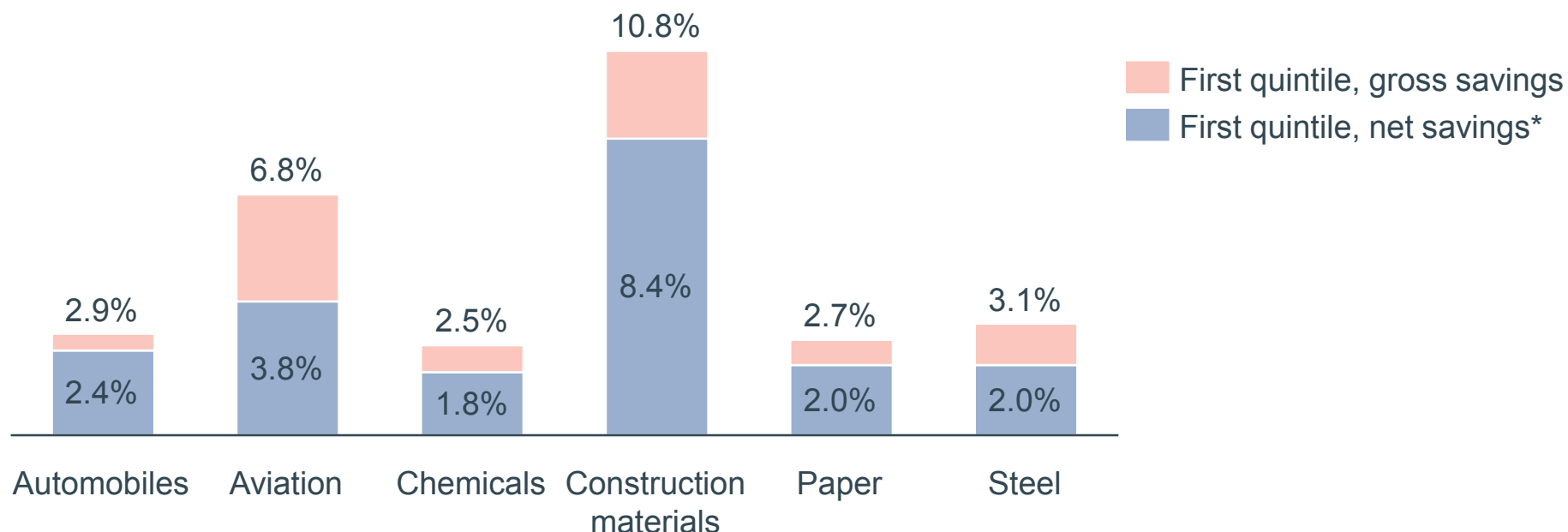
*Second quintile*

*+ 0.3 to 2.8% p.a.*

## There is significant potential for financial benefit (4/5)

A lot of this potential requires little to no capital investment, largely thanks to recent improvements in technology which have made significant operational improvements possible. Overall, only 29% of the activities implemented by companies required capital investment greater than three years worth of energy cost savings. If capital costs were to be discounted from the savings in energy costs, the potential growth in annual profits would still range between 2% and 8% for each year of implementation, or 10% to 40% over 5 years.

### % Profit uplift per annum (50% companies with highest increase)

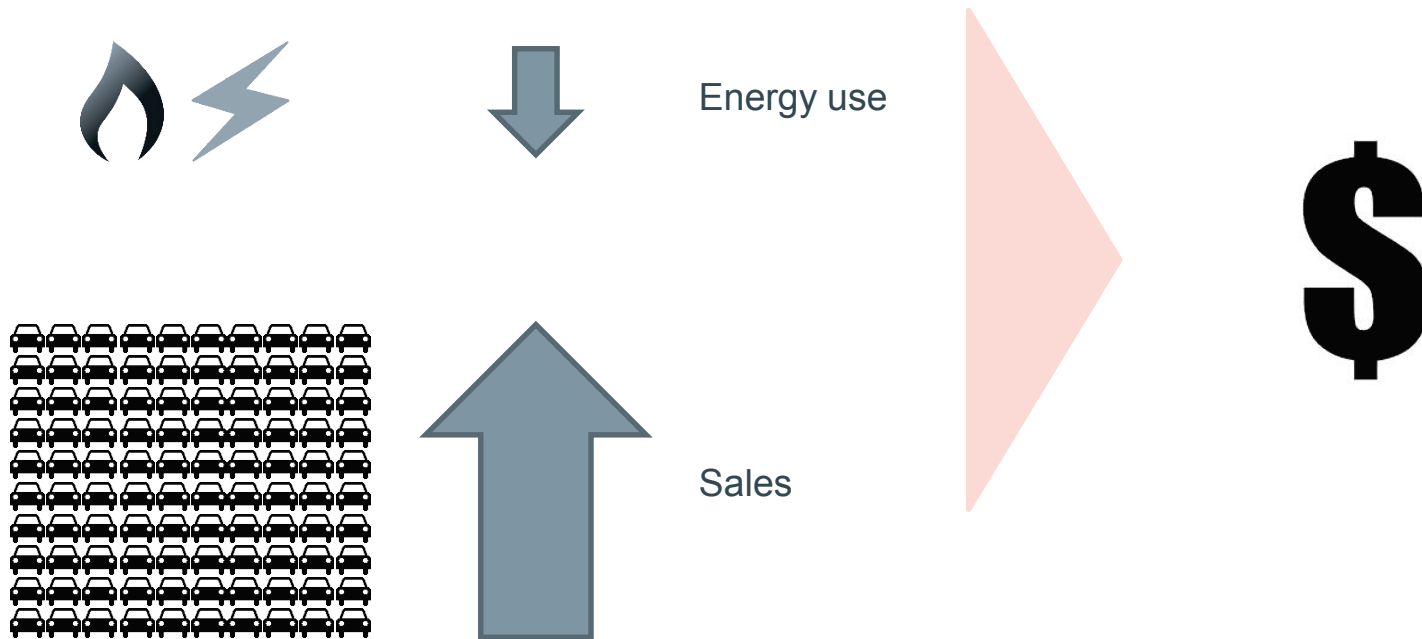


## Notes on estimating net monetary savings

- Companies are asked to disclose “the amount of monetary savings per year expected from the initiative (e.g. in reduced energy costs)” to CDP Climate Change Questionnaire CC3.3b. It is understood that these savings do not account for the cost of capital investment required (where applicable) and hence are ‘gross’ savings. Companies are also asked to disclose the total investment required (\$), payback period (years) and the estimated lifetime of the initiative (\$, 2014 only)
- In order to determine the ‘net’ savings, the annual repayment costs of the investment required was calculated and deducted from the annual monetary savings disclosed. Where investment required was not disclosed, it was reconstructed using the annual monetary savings and payback period. The annual repayment costs were calculated assuming constant repayments and a constant interest rate of 10% over the lifespan specified.
- For all 2013 responses, and where companies did not disclose a lifespan in 2014 responses, an average lifespan for the sector was used. This average lifespan was determined in each sector by taking the average of lifespans disclosed by companies in 2014. For the Chemicals sector, a lifespan of 10 years was imposed where one was not disclosed.
- The ratio of ‘net’ to ‘gross’ monetary saving was used to discount the potential EBIT uplift and hence give an indication of the net EBIT uplift available to companies.

## There is significant potential for financial benefit (5/5)

Translating the potential growth to actual additional profits for companies in the automobiles sector, a 2% difference would be equal to about \$100 million. Such an increase in profits from revenue growth would require additional sales worth approximately \$2,161 million in that sector, or 90,000 more cars each year.



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## From an initial list of 47 industrial sub-sectors, analysis first identified sectors where energy productivity was likely to have significant impact

In order to provide investors with useful analysis of key industrial sectors and key companies within those sectors, the analysis first identified sectors where energy productivity was likely to have significant impact. This assessment was based on three key energy measures for companies within a sector:

1. **Sensitivity to energy costs:** How significant are energy costs compared to profit margins?
2. **Magnitude of energy efficiency opportunity:** How large are these companies' energy bills and how much could they save by improving energy productivity in line with best performing peers?
3. **Strategic importance to investors:** How large is the sector, and how prominent are carbon management issues?

# The analysis identified 17 sub-sectors where company energy productivity was most material, based on three key energy measures

The higher the score, the greater the materiality of energy productivity risks and opportunities for that sector.

Detailed definitions of each metric are presented on the following slides

	Overall score	Sensitivity to energy costs		Magnitude of energy efficiency opportunity		Strategic importance to investors	
		Materiality of energy costs (% Energy spend / Operational spend)	Profitability (% EBIT / Operational spend)	Energy costs (\$m per company)	Potential financial upside (% potential \$ savings / Operational spend)	Emissions intensity (tCO <sub>2</sub> e/\$ '000 operational spend)	Size of sector (\$m revenue)
<b>Industrial sectors</b>							
Steel	3.55	19%	5%	3,428	0.2%	1.7	336,194
Marine	3.33	37%	7%	3,059	0.2%	0.8	145,779
Airlines	3.28	30%	5%	5,156	0.1%	1.0	211,818
Integrated Oil & Gas	3.22	16%	10%	17,507	0.2%	0.3	2,230,216
Oil & Gas Refining & Marketing	2.99	15%	3%	2,146	0.1%	0.2	449,070
Construction Materials	2.96	24%	9%	1,341	0.3%	3.2	134,178
Gas Utilities	2.92	26%	11%	4,268	0.1%	0.4	113,313
Multi-Utilities	2.69	27%	15%	6,933	0.1%	1.9	359,896
Diversified Metals & Mining	2.59	22%	12%	1,408	0.1%	1.1	270,190
Diversified Chemicals	2.54	9%	8%	1,576	0.1%	0.4	429,258
Paper & Forest Products	2.45	11%	8%	778	0.2%	0.5	128,734
Building Products	2.45	17%	7%	651	0.1%	0.3	141,158
Commodity Chemicals	2.43	9%	6%	751	0.2%	0.3	194,425
Aluminum	2.42	21%	4%	2,134	0.0%	N/A	37,540
Automobiles	2.21	5%	6%	2,612	0.1%	0.0	1,635,498
Air Freight & Logistics	2.08	12%	7%	1,284	0.0%	0.2	229,022
Electronic Equipment	2.06	9%	5%	588	0.1%	0.1	491,046

Legend	>3	>15%	<5%	>2,000	>0.2%	>0.3	>5,000,000
	>2	>10%	<10%	>1,300	>0.1%	>0.2	>2,000,000
	>1	>5%	<15%	>600	>0.0%	>0.1	>1,000,000





## Sensitivity to energy costs: How significant are energy costs compared to profit margins?

The *sensitivity to energy costs* of a sector determines the significance of energy costs relative to its profit margin and therefore the importance of potential increases in energy costs to companies in the sector. This criteria was determined by two metrics: **Materiality of energy costs**, and **Profitability**. These metrics were assigned the highest weights, at 25% each.

- **Materiality of energy costs** was measured by the average energy expenditure as a percentage of total operational spend in a sector (%). Companies where energy costs are larger, relative to their overall expenditure, are likely to be more exposed to energy risks, including changes in current and future energy costs, but could also stand to enjoy greater benefits from improving their energy efficiency performance.
- **Profitability** of a company was measured by the EBIT of a company relative to its total operational spend (%). Profitability of a company provides additional insight into how critical energy costs are to a company. A company that has relatively low profitability will be more sensitive to potential increases in energy costs which will have a larger impact on its profit margins. Companies with low profit margins may also be more exposed to adverse movements in the markets they operate in, making them more vulnerable to other external factors. Therefore, improvements in profitability which could be delivered by better energy productivity will be very valuable to these companies.

## Magnitude of energy efficiency opportunity: How large are these companies' energy bills and how much could they save by improving energy productivity in line with best performing peers?

This criteria was determined by two metrics: Potential financial upside, and Energy costs per company. These metrics were assigned 15% weighting each.

- The **potential financial upside** from energy efficiency improvements of a sector was estimated through the difference in annual financial savings, available through implemented energy efficiency opportunities, between best and worst performing companies. This metric is expressed as a percentage of total operational spend so that it can be easily compared with companies current profitability as expressed in the table. The difference between companies with the most energy savings and companies with the least energy savings represents an order of magnitude of the potential financial gain for companies in a sector.
- **Energy costs** were measured by the average energy expenditure per company in each sector (\$m spent on energy per company). While all the other criteria are expressed as a percentage of operating expenditure, this criteria allows investors to gauge the absolute value at stake should companies in the sector improve their energy productivity.

## Strategic importance to investors: How large is the sector, and how prominent are carbon management issues?

This criteria was determined by two metrics: Size of the sector, and Emissions intensity. These metrics were assigned 10% weighting each.

- In our analysis, we estimated the **size of a sector** using the total operating revenue of companies (\$m operating revenue) in the sector as a proxy. Companies that are larger, in financial terms, are likely to have a more significant impact on an investor's portfolio through potential savings from energy productivity. As such, sectors with companies that have greater operating revenue were prioritized in our analysis.
- **Emissions intensity** of a company was measured by the amount of emissions produced per unit of operational spend (tCO<sub>2</sub>e per \$000 total operational spend). A higher emissions intensity could be an indication of higher exposure to existing or potential additional costs associated with carbon pricing, other greenhouse gas mitigation policies, or an internal carbon price that companies may impose. This metric can help investors identify sectors where it is critical for companies to have a carbon mitigation strategy in place, of which improvements in energy productivity are likely to be a key element.

In addition to the 17 sectors listed previously, the initial list of 47 industrial sub-sectors also included the following sectors

	Overall score
<b>Industrial sectors</b>	
Food Products	1.91
Industrial Conglomerates	1.79
Oil & Gas Storage & Transportation	1.78
Road & Rail	1.77
Construction & Engineering	1.75
Oil & Gas Exploration & Production	1.73
Semiconductors & Semiconductor Equipment	1.72
Specialty Chemicals	1.66
Machinery	1.62
Communications Equipment	1.61
Industrial Gases	1.60
Household Durables	1.58
Energy Equipment & Services	1.57
Aerospace & Defense	1.51
Containers & Packaging	1.51
Electrical Equipment	1.48
Gold	1.37
Auto Components	1.27
Household Products	1.04
Personal Products	1.03
Textiles, Apparel & Luxury Goods	0.97
Transportation Infrastructure	0.87
Beverages	0.84
Precious Metals & Minerals	0.79
Coal & Consumable Fuels	0.69
Fertilizers & Agricultural Chemicals	0.67
Leisure Equipment & Products	0.65
Water Utilities	0.49
Health Care Equipment & Supplies	0.41
Tobacco	0.38

This project analyzed companies within six of the 17 sectors initially prioritized

The six sectors analyzed in detail are:



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The benchmarking methodology developed for this representative sample could be extended to other sectors in the future.

Please click on each icon to look at detailed results for each sector.

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## Engagement recommendations to investors regarding each company analyzed are made based on publicly available information provided to CDP

Companies are placed in one of six categories reflecting companies' performance based on reported data. Hollow circles are used to reflect companies with insufficient/uncertain data. These categories offer recommendations to investors regarding each company analyzed across the six sectors.


### Satisfactory data

-  Positive results; could discuss potential to optimize: Indicates company showed strong performance on most metrics considered and material effort in energy productivity and efficiency. Indicates relatively low risks related to energy costs.
-  Request clarification of results and discuss potential to improve: Company shows medium to low performance on several metrics. Increased effort to improve energy productivity and efficiency could potentially deliver material financial benefit - alternatively, external factors/incomplete reporting may explain observed results. Recommend further inquiry to clarify and assess potential financial gain.

### Insufficient data

-   Results provisional due to data uncertainty. Request additional data to confirm rating: One or more metric with low quality or incomplete data reported; request for better data is recommended before validating results
-  Data provided is insufficient to conduct analysis; require more information: Company provided insufficient information to assess energy productivity and efficiency performance. Given the materiality of potential risks and opportunities, a request for more information is recommended

### Not included in analysis

-  Out of scope: Different type of activity, or low energy cost making analysis too uncertain.

Results are presented overleaf. Detailed results and comparisons for companies within each sector are presented in later sections and can be accessed directly by clicking on the icons below.



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PAPER



STEEL



CHEMICALS


















CONSTRUCTION MATERIALS




















# The sector indices identify portfolio companies and recommended actions for each (1/2)
















## Airlines

Company	Rating
 Air NewZealand	74%
 Finnair	72%
 United Continental Holdings	65%
 Air France - KLM	61%
 KoreanAir	52%
 Southwest Airlines Co.	49%
 Air Canada	32%
 British Airways	27%
 Qantas Airways Ltd	22%
 Delta Air Lines	19%
 Cathay Pacific Airways Limited	13%
 American Airlines Group Inc	13%
 7 companies with incomplete/insufficient data provided to CDP to conduct analysis (Aer Lingus Group PLC, Asiana Airlines, easyJet, Gol Linhas Aereas Inteligentes S.A., TAM S.A., Virgin Australia Holdings, WestJet Airlines Ltd.).	
 All other companies did not report to CDP	
 5 companies that were reviewed but excluded from analysis (Air Partner Plc, Hong Kong Aircraft Engineering, IBERIA, International Consolidated Airlines Group, S.A., SAS).	



## Automobiles

Company	Rating
 DaimlerAG	74%
 Toyota Motor Corporation	73%
 Fiat	67%
 BMWAG	66%
 Hyundai Motor	62%
 Mahindra & Mahindra	53%
 Mazda Motor Corporation	52%
 Renault	45%
 General Motors Company	39%
 Honda Motor Company	37%
 VolkswagenAG	36%
 Nissan Motor Co., Ltd.	34%
 Ford Motor Company	32%
 PSA Peugeot Citroen	22%
 5 companies with incomplete/insufficient data provided to CDP to conduct analysis (Dr. Ing. h. c. F. Porsche AG, Fuji Heavy Industries Ltd., Jaguar Land Rover Ltd, Mitsubishi Motors Corporation, TOFAŞ TÜRKMOTOBŞL FABRİKASI A.Ş.).	
 All other companies did not report to CDP	
 6 companies that were reviewed but excluded from analysis (Astra International, Magna International, MARTINREA INTERNATIONAL INC., Navistar International Corporation, TOYOTA CAETANO, Williams Grand Prix Engineering Limited).	



## Chemicals

Company	Rating
 Toray Industries, Inc.	87%
 Kuraray Co., Ltd.	62%
 Wacker Chemie AG	55%
 Ercros	48%
 Sumitomo Chemical Co., Ltd.	47%
 Kemira Corporation	46%
 Mitsui Chemicals, Inc.	43%
 Dow Chemical Company	35%
 Hanwha Chemical	29%
 Linde AG	27%
 Teijin Ltd.	13%
 Mitsubishi Chemical Holdings Corporation	10%
 24 companies with incomplete/insufficient data provided to CDP to conduct analysis (Agrium Inc., ALTANAAG, ARKEMA, Cabot Corporation, Cheil Industries, Daicel Chemical Industries, Ltd., DIC Corporation, Eastman Chemical Company, Formosa Plastics (US), Hyosung Corporation, JSR Corporation, KP Chemical Corp, Methanex Corporation, OCI Company Ltd, Orica Ltd, PPG Industries, Inc., SamsungFineChem, Toyobo Co., Ltd., Ube Industries, Ltd., Woongjin Chemical Co., Ltd., LG Chemical, Lotte Chemical, Solvay S.A., PETKŞM PETROKŞMYA HOLDŞNGA.Ş.).	
 All other companies did not report to CDP	
 16 companies that were reviewed but excluded from analysis (E.I. du Pont de Nemours and Company, AECI Ltd Ord, Akzo Nobel, Asahi Kasei Corporation, BASF SE, Essentra, FujiFilm Holdings Corporation, Hanwha Corp., Hitachi Chemical Company, Ltd., Nissinbo Holdings Inc., Nitto Denko Corporation, PTT Global Chemical, Shin-Etsu Chemical Co., Ltd., SK Chemicals, Symrise AG, Valspar Corporation).	


### Satisfactory data

-  Positive results; could discuss potential to optimize
-  Request clarification of results and discuss potential to improve

### Insufficient data

-  Results provisional due to data uncertainty. Request additional data to confirm rating
-  Data provided is insufficient to conduct analysis; require more information
















### Not included in analysis

-  Out of scope





# The sector indices identify portfolio companies and recommended actions for each (2/2)

















## Construction materials

Company	Rating
 Marshalls	88%
 Pretoria Portland Cement Co Ltd	73%
 ACC	70%
 Cementir Holding SpA	69%
 Imerys	51%
 Ultratech Cement	46%
 HeidelbergCement AG	38%
 Italcementi	29%
 Lafarge	22%
 CEMEX	18%
 Buzzi Unicem	12%
 Boral	6%
 7 companies with incomplete/insufficient data provided to CDP to conduct analysis (Ecocem, KONYA ÇŞMENTO SANAYŞŞ A.Ş., Taiheiyo Cement Corporation, Ambuja Cements, Holcim, AKÇANSA ÇŞMENTO SANAYŞŞ VE TŞCARET A.Ş., ÇŞMSA ÇŞMENTO SANAYŞŞ VE TŞCARET A.Ş.).	
 All other companies did not report to CDP	
 2 companies that were reviewed but excluded from analysis (CRH Plc, Fletcher Building).	




### Satisfactory data

-  Positive results; could discuss potential to optimize
-  Request clarification of results and discuss potential to improve












## Paper

Company	Rating
 Svenska Cellulosa Aktiebolaget	83%
 Metsä Board	78%
 MeadWestvaco Corp.	72%
 Smurfit Kappa Group PLC	53%
 Stora Enso Oyj	45%
 UPM-Kymmene Corporation	43%
 BillerudKorsnäs	43%
 Mondi PLC	42%
 Klabin S/A	42%
 International Paper Company	35%
 Ahlstrom Corporation	33%
 Holmen	16%
 Sappi	10%
 13 companies with incomplete/insufficient data provided to CDP to conduct analysis (FIBRIA Celulose S/A, Adveo, Arkhangelsk Pulp and Paper Mill, Catalyst Paper, Domtar Corporation, Empresas CMPC, Nippon Paper Group Inc, Nippon Paper Industries Co Ltd, Norske Skog, PaperlinX Ltd, Resolute Forest Products Inc., Shenzhen MYS Environmental Protection&Technology Company LTD, Suzano Pulp and Paper S.A.).	
 All other companies did not report to CDP	
 1 company that was reviewed but excluded from analysis (Hansol Paper Co., Ltd.).	

### Insufficient data

-   Results provisional due to data uncertainty. Request additional data to confirm rating
-  Data provided is insufficient to conduct analysis; require more information

## Steel

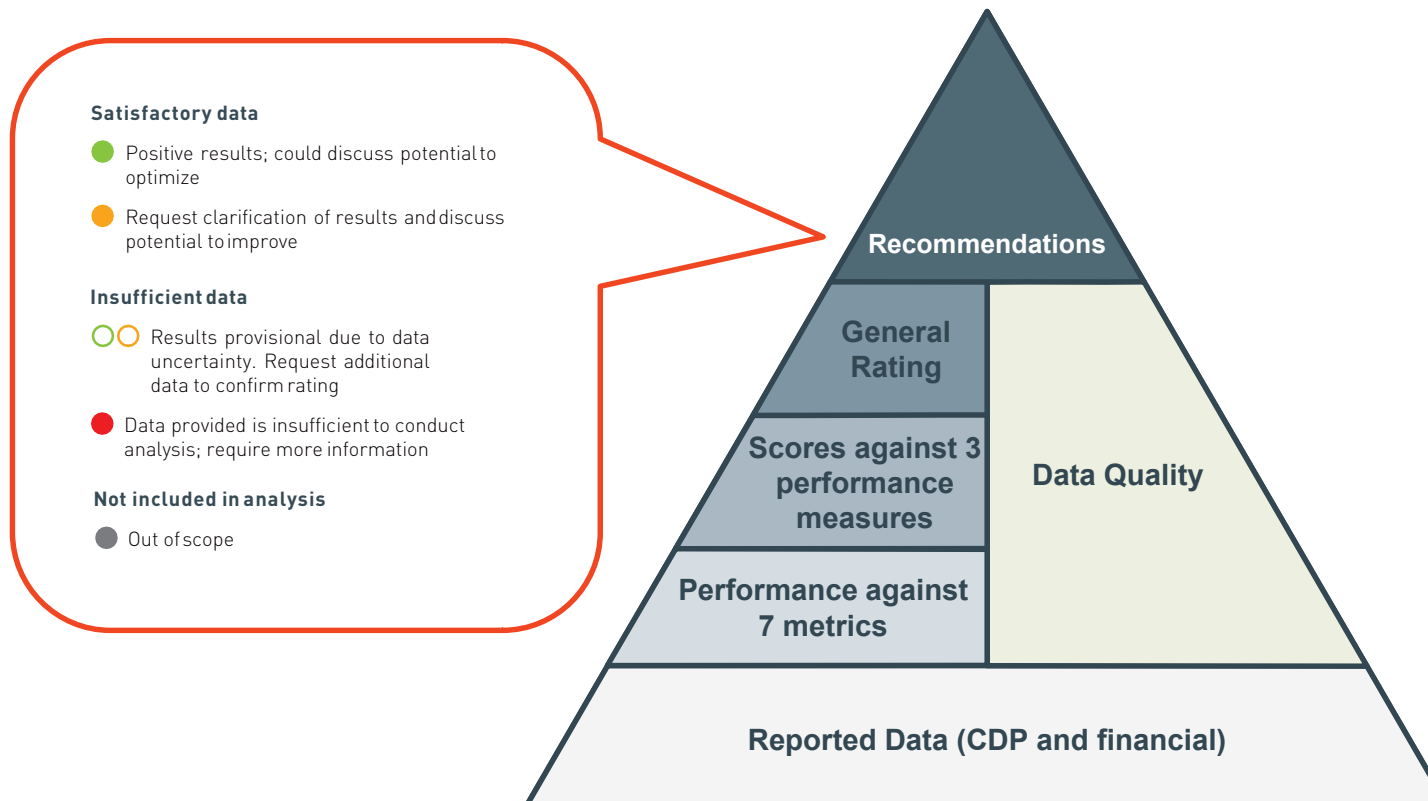
Company	Rating
 Hyundai Steel	80%
 Arcelor Mittal	74%
 China Steel	59%
 JSW Steel	58%
 Tata Steel	25%
 Cia. Siderurgica Nacional - CSN	21%
 United States Steel Corporation	20%
 POSCO	14%
 19 companies with incomplete/insufficient data provided to CDP to conduct analysis (Alba SE, APERAM, Arrium, Bekaert NV, BlueScope Steel Ltd, Cliffs Natural Resources Inc, Essar Steel Group, Fortescue Metals Group, Gindalbie Metals, Highveld Steel And Vanadium Corporation Limited, Hill & Smith Holdings, Höganäs AB, JFE Holdings, Inc., KARDEMŞR KARABÜK DEMŞR ÇELŞK SANAYŞŞ VE TŞCARET A.Ş., Kobe Steel, SSAB, Sumitomo Metal Industries, Ltd., Sundance Resources, Welspun-Gujarat Stahl Rohren).	
 All other companies did not report to CDP	
 5 companies that were reviewed but excluded from analysis (ACERINOX, Arcelor Mittal South Africa Ltd, Outokumpu Oyj, Sims Metal Management Limited, United Industries).	

### Not included in analysis

-  Out of scope

## The recommended actions consider both company performance and reporting uncertainty

Recommendations to investors are determined by the methodology below, based on a company's performance (General Rating) and the quality of its reported data.





# Methodology for companies benchmarking

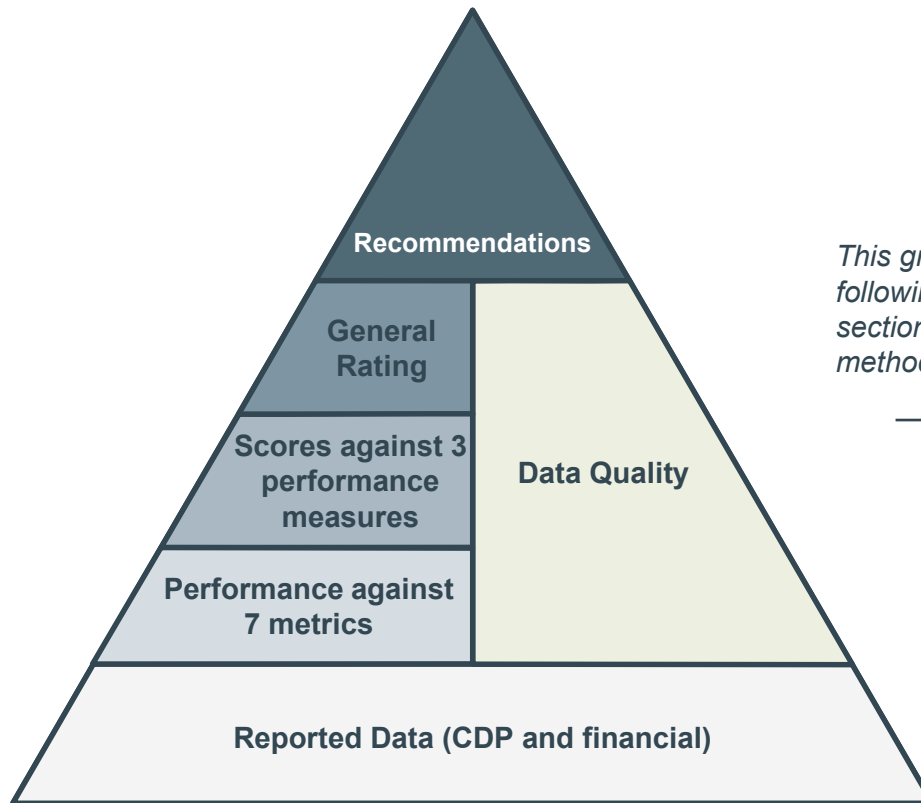
## **General rating, scores and metrics**

Calculating the metrics

Data quality

## The following section explains how the results were determined

Recommendations to investors are determined by the methodology below, based on a company's performance (General Rating) and the quality of its reported data.



*This graphic is used on the following pages, with the filled section indicating what stage of the methodology is being discussed.*





## The analysis was built upon voluntarily reported, publicly available energy and financial data

- > The data is sourced from two primary sources: **CDP Climate Change questionnaire public responses** and **financial reports**.
- > In some cases, these sources were augmented with data from individual company annual or sustainability reports as well as production information from industry publications



This data was used to inform seven metrics, grouped into three measures, that compares each companies performance relative to it's peers

### Energy cost resilience

Measured through how much a company spends on energy and its profitability. A company that spends less for energy and has greater profitability is more resilient to changes in its market environment, including energy prices or revenue.

The two metrics in this measure are:

- Energy cost range

- Profitability

### Energy productivity outcome

Measured through a company's current ability to generate revenue or increase its production per unit of energy used, and how this has trended in recent years.

The two metrics in this measure are:

- Energy productivity

- Energy productivity, average annual % change

### Energy efficiency performance

Measured because energy productivity can be influenced by many factors, some of which are beyond the direct control of a company. It includes energy savings achieved in a year and the potential for additional financial benefit, if the company matched the energy efficiency of leading performers in that sector.

The three metrics in this measure are:

- Savings per year

- Potential financial uplift if reach top quintile

- Potential financial uplift if reach second quintile



## Companies results in each metric are shown in a detailed table

Company	General Rating	Energy cost resilience		Energy productivity outcome		Energy efficiency performance			Additional information
		10%	10%	20%	15%	15%	15%	15%	
		Energy cost range, % opex	Profitability, EBIT/Revenue	Energy productivity, \$'000 Revenue/GJ	Energy productivity, Average annual % change (earliest to latest)	Savings per year, % est. energy cost	Potential financial uplift [% EBIT] if reach top quintile	Potential financial uplift [% EBIT] if reach second quintile	Emissions reduction from energy efficiency activities, % gross scope 1 & 2 emissions
Air New Zealand	74%	25-30%	7.3%	0.10	7.1%	0.55%	2.6%	0.3%	0.6%
\$ Finnair	72%	30-35%	-0.5%	0.09	-0.4%	1.61%	0.0%	0.0%	2.5%
United Continental Holdings	65%	NR	5.7%	0.08	5.3%	0.75%	2.5%	0.0%	1.3%
Air France - KLM	61%	40-45%	1.7%	0.08	7.6%	1.07%	6.0%	0.0%	2.0%
Korean Air	52%	NR	1.6%	0.06	-1.3%	1.52%	0.0%	0.0%	1.6%
Southwest Airlines Co.	49%	35-40%	10.2%	0.07	2.8%	0.45%	2.8%	0.7%	0.5%
Air Canada	32%	25-30%	5.6%	0.09	-1.5%	0.07%	5.7%	2.7%	0.4%
British Airways	27%	30-35%	7.3%	0.07	0.2%	0.23%	4.4%	1.8%	0.2%
Qantas Airways Ltd	22%	30-35%	-3.1%	0.08	3.8%	0.07%	-13.3%	-6.3%	0.1%
Delta Air Lines	19%	35-40%	5.7%	0.07	-4.0%	0.39%	5.7%	1.7%	0.5%
Cathay Pacific Airways Limited	13%	35-40%	2.8%	0.06	2.1%	0.00%	12.0%	6.0%	0.0%
American Airlines Group Inc	13%	30-35%	8.8%	0.07	ID	0.06%	4.2%	2.0%	0.2%





## These results informed the underlying score achieved against each of the seven metrics

Company	Weights [%]	Metrics		Underlying scores	
		General Rating	Energy cost resilience	20%	10%
			10% Energy cost range, % opex	10% Profitability, EBIT/Revenue	10% Energy cost range, % opex
Air New Zealand	74%	74%	25-30% 7.3%	73%	73%
Finnair	72%	72%	30-35% -0.5%	0%	0%
United Continental Holdings	65%	65%	NR 5.7%	0%	57%
Air France - KLM	61%	61%	40-45% 1.7%	0%	17%
KoreanAir	52%	52%	NR 1.6%	0%	16%
Southwest Airlines Co.	49%	49%	35-40% 10.2%	100%	100%
Air Canada	32%	32%	25-30% 5.6%	8%	56%
British Airways	27%	27%	30-35% 7.3%	0%	73%
Qantas Airways Ltd	22%	22%	30-35% -3.1%	0%	0%
Delta Air Lines	19%	19%	35-40% 5.7%	0%	57%
Cathay Pacific Airways Limited	13%	13%	35-40% 2.8%	0%	28%
American Airlines Group Inc	13%	13%	30-35% 8.8%	0%	88%

**2**

**Low-performance ceiling < Company performance < High-performance ceiling**

Air New Zealand's profitability (7.3%) falls between the low- and high-performance ceilings. As such, its assigned score is proportional to its performance relative to these ceilings, i.e.  $\frac{7.3\%}{10\%} = 0.73 = 73\%$

**Company performance > High-performance ceiling**

Southwest Airline's profitability (10.2%) exceeds the high-performance ceiling (10%) in this case. As such, it scores 100% on this metric, reflecting the best performance being achieved.

**Company performance < Low-performance ceiling**

Qantas Airways Ltd's profitability (-3.1%) falls below the low-performance ceiling (0%) in this case. As such, it scores 0% on this metric, reflecting the greatest room for improvement on this metric.

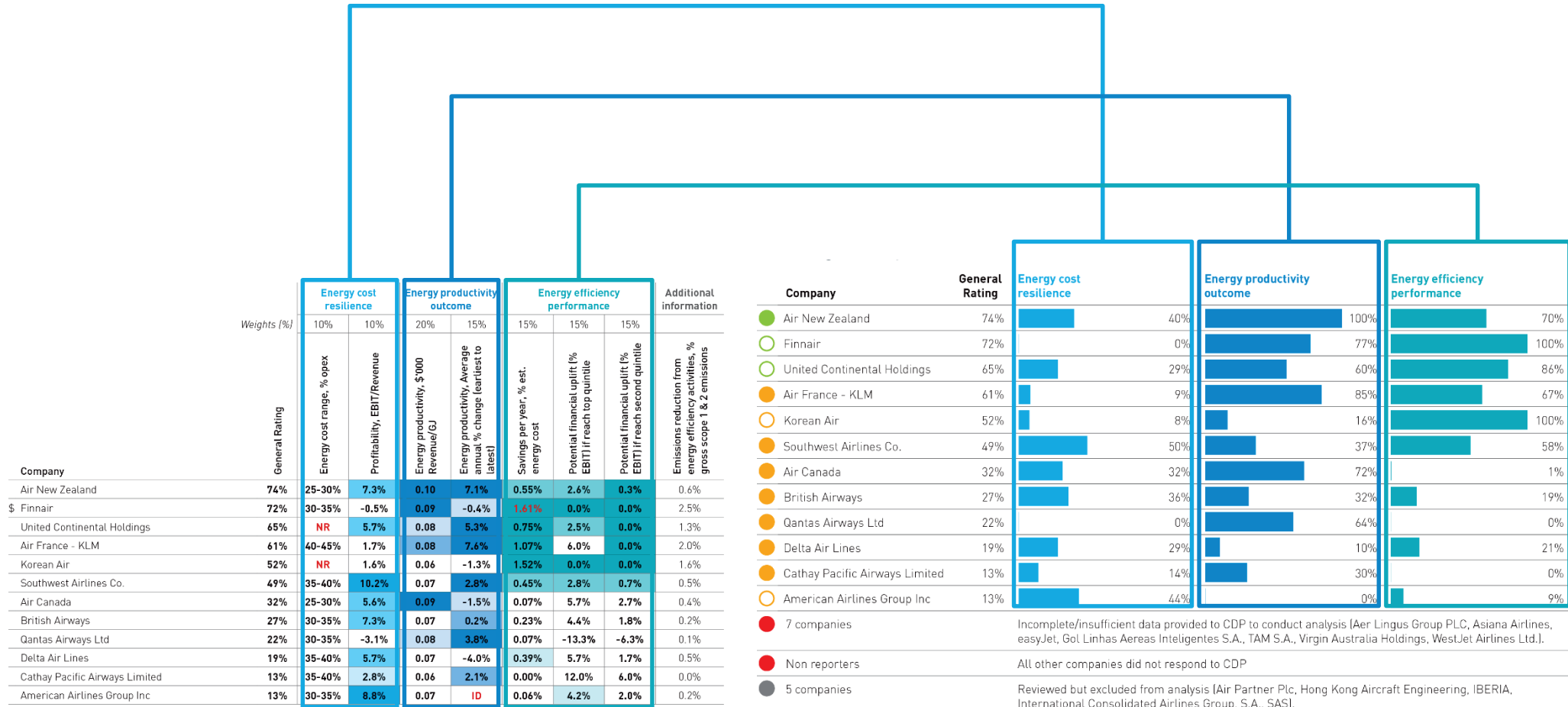
**1**

Each metric has a **high- and low-performance ceiling**. Companies that outperform the high ceiling are given the highest score, while companies that underperform the low ceiling are given the lowest score. Companies with performance that falls between these boundaries are given a score proportional to their performance.

Ceiling - high performance	0%	10%
Ceiling - low performance	30%	0%



# We grouped the seven metrics into three measures...





... and aggregated the underlying scores into a weighted average for presentation in each sector index

Example

## Energy cost resilience

Company	General Rating	Energy cost resilience	
Air New Zealand	74%	<div></div>	40%
Finnair	72%	<div></div>	0%
United Continental Holdings	65%	<div></div>	29%
Air France - KLM	61%	<div></div>	9%
Korean Air	52%	<div></div>	8%
Southwest Airlines Co.	49%	<div></div>	50%
Air Canada	32%	<div></div>	32%
British Airways	27%	<div></div>	36%
Qantas Airways Ltd	22%	<div></div>	0%
Delta Air Lines	19%	<div></div>	29%
Cathay Pacific Airways Limited	13%	<div></div>	14%
American Airlines Group Inc	13%	<div></div>	44%

Weights	20%	
	10%	10%
Energy cost range, % opex	Profitability, EBIT/Revenue	
	8%	73%
	0%	0%
	0%	57%
	0%	17%
	0%	16%
	0%	100%
	8%	56%
	0%	73%
	0%	0%
	0%	57%
	0%	28%
	0%	88%

The score against each particular measure is the sum product of the scores for each metric

$$\text{i.e. } \frac{(8\% \times 10\%) + (73\% \times 10\%)}{(10\% + 10\%)} = 40\%$$

More generally,

$$\text{Score against key measures} = \frac{\sum_{i=1}^x (\text{Score } i \times \text{Weight } i)}{\sum_{i=1}^x \text{Weight } i}$$

where  $x$  = number of metrics (2 or 3)

This process is repeated for metrics in the other measures

Energy productivity outcome

Energy efficiency performance

Underlying scores





Similarly, these scores for were further aggregated to determine the general rating

### Final calculation of General Rating

Scores for each measure are multiplied by the weight assigned for the measure to give a General Rating for each company, e.g.

$$\text{General Rating} = \sum_{i=1}^3 (\text{Score } i \times \text{Weight } i)$$

#### Airlines

Company	Rating
Air New Zealand	74%
Finnair	72%
United Continental Holdings	65%
Air France - KLM	61%
Korean Air	52%
Southwest Airlines Co.	49%
Air Canada	32%
British Airways	27%
Qantas Airways Ltd	22%
Delta Air Lines	19%
Cathay Pacific Airways Limited	13%
American Airlines Group Inc	13%

7 companies with incomplete/insufficient data provided to CDP to conduct analysis (Aer Lingus Group PLC, Asiana Airlines, easyJet, Gol Linhas Aereas Inteligentes S.A., TAM S.A., Virgin Australia Holdings, WestJet Airlines Ltd.).

All other companies did not report to CDP

5 companies that were reviewed but excluded from analysis (Air Partner Plc, Hong Kong Aircraft Engineering, IBERIA, International Consolidated Airlines Group, S.A., SAS).

Weights

20%

35%

45%

Company	General Rating	Energy cost resilience	Energy productivity outcome	Energy efficiency performance
Air New Zealand	74%	40%	100%	70%
Finnair	72%	0%	77%	100%
United Continental Holdings	65%	29%	60%	86%
Air France - KLM	61%	9%	85%	67%
Korean Air	52%	8%	16%	100%
Southwest Airlines Co.	49%	50%	37%	58%
Air Canada	32%	32%	72%	1%
British Airways	27%	36%	32%	19%
Qantas Airways Ltd	22%	0%	64%	0%
Delta Air Lines	19%	29%	10%	21%
Cathay Pacific Airways Limited	13%	14%	30%	0%
American Airlines Group Inc	13%	44%	0%	9%

7 companies

Non reporters

5 companies

Incomplete/insufficient data provided to CDP to conduct analysis (Aer Lingus Group PLC, Asiana Airlines, easyJet, Gol Linhas Aereas Inteligentes S.A., TAM S.A., Virgin Australia Holdings, WestJet Airlines Ltd.).

All other companies did not respond to CDP

Reviewed but excluded from analysis (Air Partner Plc, Hong Kong Aircraft Engineering, IBERIA, International Consolidated Airlines Group, S.A., SAS).



Companies were ranked in order of performance by the General Rating.  
In general a higher rating is better.



Company	General Rating	Energy cost resilience		Energy productivity outcome		Energy efficiency performance			Additional information
		Weights (%)							
		10%	10%	20%	15%	15%	15%	15%	
		Energy cost range, % opex	Profitability, EBIT/Revenue	Energy productivity, \$'000 Revenue/GJ	Energy productivity, Average annual % change (earliest to latest)	Savings per year, % est. energy cost	Potential financial uplift [% EBIT] if reach top quintile	Potential financial uplift [% EBIT] if reach second quintile	Emissions reduction from energy efficiency activities, % gross scope 1 & 2 emissions
Air NewZealand	74%	25-30%	7.3%	0.10	7.1%	0.55%	2.6%	0.3%	0.6%
\$ Finnair	72%	30-35%	-0.5%	0.09	-0.4%	1.61%	0.0%	0.0%	2.5%
United Continental Holdings	65%	NR	5.7%	0.08	5.3%	0.75%	2.5%	0.0%	1.3%
Air France - KLM	61%	40-45%	1.7%	0.08	7.6%	1.07%	6.0%	0.0%	2.0%
KoreanAir	52%	NR	1.6%	0.06	-1.3%	1.52%	0.0%	0.0%	1.6%
Southwest Airlines Co.	49%	35-40%	10.2%	0.07	2.8%	0.45%	2.8%	0.7%	0.5%
Air Canada	32%	25-30%	5.6%	0.09	-1.5%	0.07%	5.7%	2.7%	0.4%
British Airways	27%	30-35%	7.3%	0.07	0.2%	0.23%	4.4%	1.8%	0.2%
Qantas Airways Ltd	22%	30-35%	-3.1%	0.08	3.8%	0.07%	-13.3%	-6.3%	0.1%
Delta Air Lines	19%	35-40%	5.7%	0.07	-4.0%	0.39%	5.7%	1.7%	0.5%
Cathay Pacific Airways Limited	13%	35-40%	2.8%	0.06	2.1%	0.00%	12.0%	6.0%	0.0%
American Airlines Group Inc	13%	30-35%	8.8%	0.07	ID	0.06%	4.2%	2.0%	0.2%



## Finally, the performance was matched with data quality considerations and presented alongside scores against key measures

### Scores against key measures

Company	General Rating	Energy cost resilience	Energy productivity outcome	Energy efficiency performance
Air New Zealand	74%		40%	
Finnair	72%		0%	
United Continental Holdings	65%		29%	
Air France - KLM	61%		9%	
Korean Air	52%		8%	
Southwest Airlines Co.	49%		50%	
Air Canada	32%		32%	
British Airways	27%		36%	
Qantas Airways Ltd	22%		0%	
Delta Air Lines	19%		29%	
Cathay Pacific Airways Limited	13%		14%	
American Airlines Group Inc	13%		44%	
7 companies	Incomplete/insufficient data provided to CDP to conduct analysis (Aer Lingus Group PLC, Asiana Airlines, easyJet, Gol Linhas Aereas Inteligentes S.A., TAM S.A., Virgin Australia Holdings, WestJet Airlines Ltd.).			
Non reporters	All other companies did not respond to CDP			
5 companies	Reviewed but excluded from analysis (Air Partner Plc, Hong Kong Aircraft Engineering, IBERIA, International Consolidated Airlines Group, S.A., SAS).			

#### Satisfactory data

- Positive results; could discuss potential to optimize
- Request clarification of results and discuss potential to improve

#### Insufficient data

- Results provisional due to data uncertainty. Request additional data to confirm rating
- Data provided is insufficient to conduct analysis; require more information

#### Not included in analysis

- Out of scope



# Methodology for companies benchmarking

General rating, scores and metrics

## **Calculating the metrics**

Data quality



# The *Energy cost resilience* measure consists of two metrics; Energy cost range and Profitability

## Energy cost range\*

Range as specified in CDP question CC11.1  
(2013 – 14)

\* Energy costs were reported in a range, and hence some uncertainty exists. This margin of error is minimized at higher energy cost ranges.

## Profitability

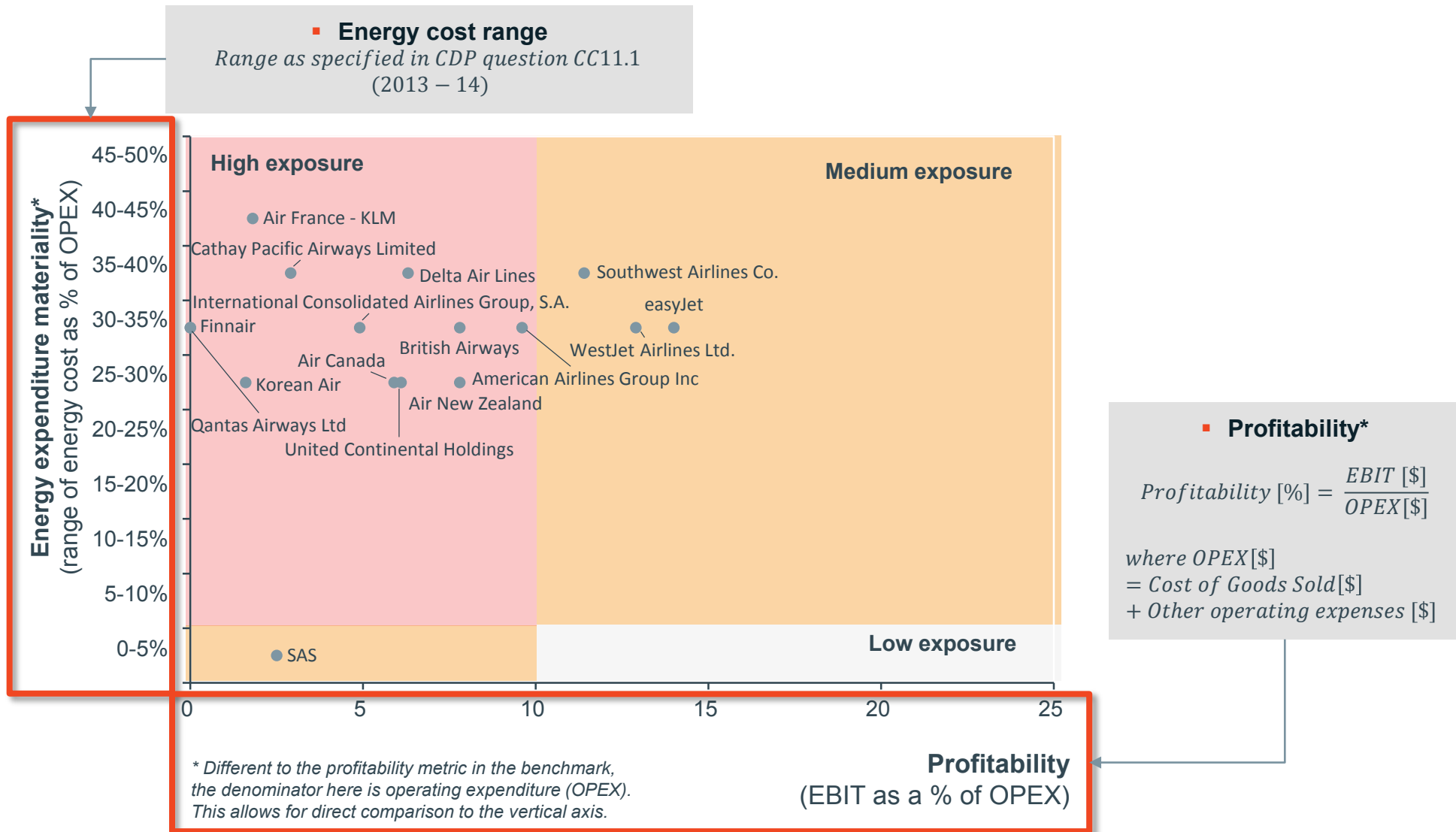
$$\text{Profitability [\%]} = \frac{\text{EBIT} [\$]}{\text{Revenue} [\$]}$$

Company		General Rating	Energy cost resilience		Energy productivity outcome		Energy efficiency performance			Additional information
			Weights (%)		20%	15%	15%	15%	15%	
			Energy cost range, % opex	Profitability, EBIT/Revenue	Energy productivity, \$'000 Revenue/GJ	Energy productivity, Average annual % change (earliest to latest)	Savings per year, % est. energy cost	Potential financial uplift (%) EBIT) if reach top quintile	Potential financial uplift (%) EBIT) if reach second quintile	Emissions reduction from energy efficiency activities, % gross scope 1 & 2 emissions
Air New Zealand	74%	25-30%	7.3%	0.10	7.1%	0.55%	2.6%	0.3%	0.6%	
\$ Finnair	72%	30-35%	-0.5%	0.09	-0.4%	1.61%	0.0%	0.0%	2.5%	
United Continental Holdings	65%	NR	5.7%	0.08	5.3%	0.75%	2.5%	0.0%	1.3%	
Air France - KLM	61%	40-45%	1.7%	0.08	7.6%	1.07%	6.0%	0.0%	2.0%	
Korean Air	52%	NR	1.6%	0.06	-1.3%	1.52%	0.0%	0.0%	1.6%	
Southwest Airlines Co.	49%	35-40%	10.2%	0.07	2.8%	0.45%	2.8%	0.7%	0.5%	
Air Canada	32%	25-30%	5.6%	0.09	-1.5%	0.07%	5.7%	2.7%	0.4%	
British Airways	27%	30-35%	7.3%	0.07	0.2%	0.23%	4.4%	1.8%	0.2%	
Qantas Airways Ltd	22%	30-35%	-3.1%	0.08	3.8%	0.07%	-13.3%	-6.3%	0.1%	
Delta Air Lines	19%	35-40%	5.7%	0.07	-4.0%	0.39%	5.7%	1.7%	0.5%	
Cathay Pacific Airways Limited	13%	35-40%	2.8%	0.06	2.1%	0.00%	12.0%	6.0%	0.0%	
American Airlines Group Inc	13%	30-35%	8.8%	0.07	ID	0.06%	4.2%	2.0%	0.2%	





This is an example of how *Energy cost resilience* metrics are shown on a scatter plot and the calculations undertaken





## Notes on *Energy cost resilience* metrics

### ■ Energy cost range

Source:

- **Energy cost:** CDP Climate Change Questionnaire CC11.1, average of 2013 and 2014 responses (mid-point of ranges used)

Notes on data point:

- Some uncertainty exists in using this range, with less margin of error for larger energy users.
- Due to this, companies with energy use in the range of 0-5% were excluded due to high uncertainty, unless other data (e.g. units of production for Automobiles) was available to augment the analysis.
- Where a company did not publicly disclose this range (i.e. did not respond to this question in CDP questionnaire) but all other data was available, a conservative approach was used to estimate the company's energy costs based on others' energy costs in the industry
- In calculating energy savings implemented per year, the highest range of energy cost in the sector was used
- In calculating the potential financial uplift from improved energy efficiency performance, the lowest range of energy cost in the sector was used

### ■ Profitability

Source:

- **EBIT (Earnings before interest and tax):** MintGlobal financial database, average of 2013 and 2014 responses
- **OPEX = Cost of Goods Sold + Other operating expenses**
  - **Cost of Goods Sold:** MintGlobal financial database, average of 2013 and 2014 responses
  - **Other operating expenses:** MintGlobal financial database, average of 2013 and 2014 responses

Notes on data point:

- To allow for consistency in the denominators of both axes, profitability here refers to EBIT / OPEX
- Where 2014 data is unavailable, average of 2012-13 values were used
- Where Cost of Goods Sold or Other operating expenses were not available for a company, OPEX was reconstructed using the average OPEX/Revenue ratios across the sector



# The *Energy productivity outcome* measure consists of two metrics; **Energy productivity**, and **Energy Productivity, average annual % change**

## Energy productivity

$$\text{Energy Productivity} \left[ \frac{\$}{GJ} \right] = \frac{\text{Revenue} [\$]}{\text{Total energy use} [GJ]}$$

## Energy productivity, average annual % change

$$\begin{aligned} &\text{Energy Productivity change, [\% per annum]} \\ &= \left( \frac{\text{Latest EP}}{\text{Earliest EP}} \right)^{\frac{1}{\text{Latest year} - \text{Earliest year}}} - 1 \end{aligned}$$

Company	General Rating	Energy cost resilience		Energy productivity outcome		Energy efficiency performance			Additional information
		Weights (%)		20%	15%	15%	15%	15%	
		Energy cost range, % opex	Profitability, EBIT/Revenue	Energy productivity, \$'000 Revenue/GJ	Energy productivity, Average annual % change (earliest to latest)	Savings per year, % est. energy cost	Potential financial uplift (% EBIT) if reach top quintile	Potential financial uplift (% EBIT) if reach second quintile	Emissions reduction from energy efficiency activities, % gross scope 1 & 2 emissions
Air NewZealand	74%	25-30%	7.3%	0.10	7.1%	0.55%	2.6%	0.3%	0.6%
\$ Finnair	72%	30-35%	-0.5%	0.09	-0.4%	1.61%	0.0%	0.0%	2.5%
United Continental Holdings	65%	NR	5.7%	0.08	5.3%	0.75%	2.5%	0.0%	1.3%
Air France - KLM	61%	40-45%	1.7%	0.08	7.6%	1.07%	6.0%	0.0%	2.0%
KoreanAir	52%	NR	1.6%	0.06	-1.3%	1.52%	0.0%	0.0%	1.6%
Southwest Airlines Co.	49%	35-40%	10.2%	0.07	2.8%	0.45%	2.8%	0.7%	0.5%
Air Canada	32%	25-30%	5.6%	0.09	-1.5%	0.07%	5.7%	2.7%	0.4%
British Airways	27%	30-35%	7.3%	0.07	0.2%	0.23%	4.4%	1.8%	0.2%
Qantas Airways Ltd	22%	30-35%	-3.1%	0.08	3.8%	0.07%	-13.3%	-6.3%	0.1%
Delta Air Lines	19%	35-40%	5.7%	0.07	-4.0%	0.39%	5.7%	1.7%	0.5%
Cathay Pacific Airways Limited	13%	35-40%	2.8%	0.06	2.1%	0.00%	12.0%	6.0%	0.0%
American Airlines Group Inc	13%	30-35%	8.8%	0.07	ID	0.06%	4.2%	2.0%	0.2%

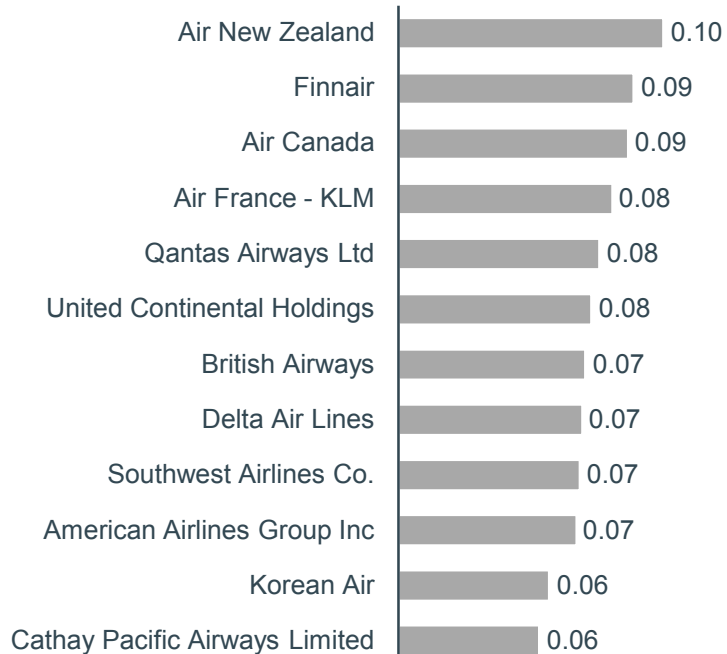


# This is an example of how *Energy productivity outcome* metrics are shown and calculated

## ■ Energy productivity

$$\text{Energy Productivity} \left[ \frac{\$}{\text{GJ}} \right] = \frac{\text{Revenue} [\$]}{\text{Total energy use} [\text{GJ}]}$$

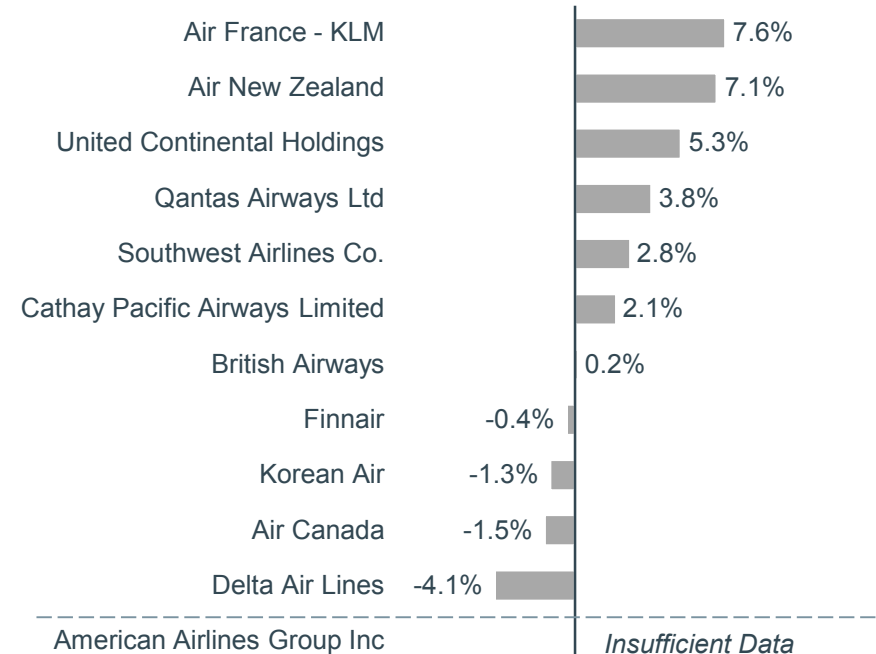
Energy productivity by company,  
\$'000 Revenue/GJ, average 2013-14 (or latest)



## ■ Energy productivity, average annual % change

$$\begin{aligned} &\text{Energy Productivity change, [\% per annum]} \\ &= \left( \frac{\text{Latest EP}}{\text{Earliest EP}} \right)^{\frac{1}{\text{Latest year} - \text{Earliest year}}} - 1 \end{aligned}$$

Energy productivity improvement,  
Average annual % change (earliest to latest)





## Notes on *Energy productivity outcome* metrics

### ■ Energy productivity

Source:

- **Energy use:** CDP Climate Change Questionnaire CC11.2 and CC11.3, average of 2013 and 2014 responses
- **Revenue:** MintGlobal financial database, average of 2013 and 2014 responses

Notes on data point:

- Where 2014 data was unavailable, average of 2012-13 values were used
- Where energy use data was not reported to CDP, these were supplemented through public reports, e.g. sustainability or annual reports
- Where possible, highly variable data (or data not clearly erroneous) was validated using external data
- Where validation was not possible, excessively high or low data points (for energy use and revenue) were removed from the analysis and calculation of averages.

### ■ Energy productivity, average annual % change

Source:

- As above

Notes on data point:

- Average annual changes were calculated using the largest range of years for which data is available across *all* metrics. These metrics are Revenue, OPEX (Cost of goods sold + Other operating expenses), EBIT, Energy use and production units, where applicable.
- Companies that had data for 2 years or less were excluded from this calculation



## The *Energy efficiency performance* measure consists of three metrics; Savings per year, and Potential financial uplift (1/2)

### ▪ Savings per year

$$\text{Savings per year [\%]} = \frac{\text{Financial savings from EE [\$]}}{\text{Estimated energy cost [\$]}}$$

where Estimate energy cost [\$] = OPEX \* mid point of energy cost range

### ▪ Potential financial uplift (detailed on next page)

Company	Weights (%)	Energy cost resilience		Energy productivity outcome		Energy efficiency performance			Additional information
		10%	10%	20%	15%	15%	15%	15%	
		Energy cost range, % opex	Profitability, EBIT/Revenue	Energy productivity, \$'000 Revenue/GJ	Energy productivity, Average annual % change (earliest to latest)	Savings per year, % est. energy cost	Potential financial uplift (%) EBIT if reach top quintile	Potential financial uplift (%) EBIT if reach second quintile	
Air NewZealand	74%	25-30%	7.3%	0.10	7.1%	0.55%	2.6%	0.3%	0.6%
\$ Finnair	72%	30-35%	-0.5%	0.09	-0.4%	1.61%	0.0%	0.0%	2.5%
United Continental Holdings	65%	NR	5.7%	0.08	5.3%	0.75%	2.5%	0.0%	1.3%
Air France - KLM	61%	40-45%	1.7%	0.08	7.6%	1.07%	6.0%	0.0%	2.0%
KoreanAir	52%	NR	1.6%	0.06	-1.3%	1.52%	0.0%	0.0%	1.6%
Southwest Airlines Co.	49%	35-40%	10.2%	0.07	2.8%	0.45%	2.8%	0.7%	0.5%
Air Canada	32%	25-30%	5.6%	0.09	-1.5%	0.07%	5.7%	2.7%	0.4%
British Airways	27%	30-35%	7.3%	0.07	0.2%	0.23%	4.4%	1.8%	0.2%
Qantas Airways Ltd	22%	30-35%	-3.1%	0.08	3.8%	0.07%	-13.3%	-6.3%	0.1%
Delta Air Lines	19%	35-40%	5.7%	0.07	-4.0%	0.39%	5.7%	1.7%	0.5%
Cathay Pacific Airways Limited	13%	35-40%	2.8%	0.06	2.1%	0.00%	12.0%	6.0%	0.0%
American Airlines Group Inc	13%	30-35%	8.8%	0.07	ID	0.06%	4.2%	2.0%	0.2%



## The *Energy efficiency performance* measure consists of three metrics; Savings per year, and Potential financial uplift (2/2)

### ■ Potential financial uplift

*Savings per year, difference to Top Quintile [%] = Top Quintile savings per year [%] – Savings per year [%]*

*Potential financial uplift [%] =  $\frac{\text{Savings per year, difference to First Quintile [\%]} * \text{Estimated energy cost}[\$]}{\text{EBIT} [\$]}$*

The above calculation is repeated for difference in energy savings per year between individual companies and the *second quintile*.

Company	General Rating	Energy cost resilience		Energy productivity outcome		Energy efficiency performance			Additional information
		10%	10%	20%	15%	15%	15%	15%	
		Energy cost range, % opex	Profitability, EBIT/Revenue	Energy productivity, \$'000 Revenue/GJ	Energy productivity, Average annual % change (earliest to latest)	Savings per year, % est. energy cost	Potential financial uplift % EBIT if reach top quintile	Potential financial uplift % EBIT if reach second quintile	Emissions reduction from energy efficiency activities, % gross scope 1 & 2 emissions
Air NewZealand	74%	25-30%	7.3%	0.10	7.1%	0.55%	2.6%	0.3%	0.6%
Finnair	72%	30-35%	-0.5%	0.09	-0.4%	1.61%	0.0%	0.0%	2.5%
United Continental Holdings	65%	NR	5.7%	0.08	5.3%	0.75%	2.5%	0.0%	1.3%
Air France - KLM	61%	40-45%	1.7%	0.08	7.6%	1.07%	6.0%	0.0%	2.0%
Korean Air	52%	NR	1.6%	0.06	-1.3%	1.52%	0.0%	0.0%	1.6%
Southwest Airlines Co.	49%	35-40%	10.2%	0.07	2.8%	0.45%	2.8%	0.7%	0.5%
Air Canada	32%	25-30%	5.6%	0.09	-1.5%	0.07%	5.7%	2.7%	0.4%
British Airways	27%	30-35%	7.3%	0.07	0.2%	0.23%	4.4%	1.8%	0.2%
Qantas Airways Ltd	22%	30-35%	-3.1%	0.08	3.8%	0.07%	-13.3%	-6.3%	0.1%
Delta Air Lines	19%	35-40%	5.7%	0.07	-4.0%	0.39%	5.7%	1.7%	0.5%
Cathay Pacific Airways Limited	13%	35-40%	2.8%	0.06	2.1%	0.00%	12.0%	6.0%	0.0%
American Airlines Group Inc	13%	30-35%	8.8%	0.07	ID	0.06%	4.2%	2.0%	0.2%

# This is an example of how *Energy efficiency performance* metric, **Savings per year** is shown and calculated



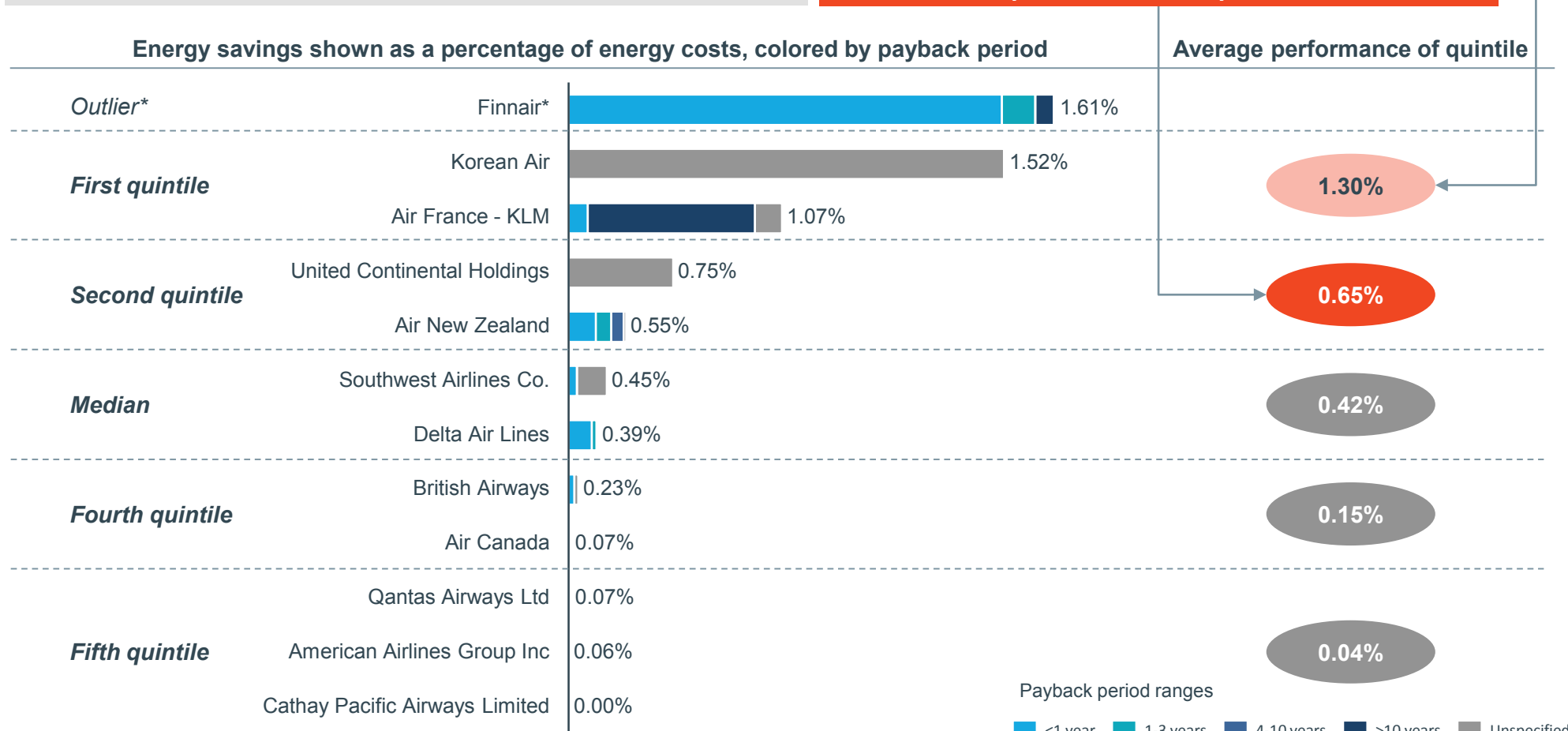
## ■ Savings per year

$$\text{Savings per year [\%]} = \frac{\text{Financial savings from EE [\$]}}{\text{Estimated energy cost [\$]}}$$

where Estimate energy cost [\$] = OPEX \* mid point of energy cost range

Top quintile savings per year  
= Average value of savings per year of  
companies ranked in top 20%

Second quintile savings per year  
= Average value of savings per year of  
companies ranked in top 20 to 40%



\* outlier due to suspected reporting of target, not actual savings achieved. Lack of detail in activities reported, with majority presented as a target rather than an achieved result. As a result, the savings were not included in the best practice averages for the sector.





# This is an example of how *Energy efficiency performance metric, Potential financial uplift if reach top quintile* is shown and calculated



## Potential financial uplift if reach top quintile

*Savings per year, difference to Top Quintile [%] = Top Quintile savings per year [%] – Savings per year [%]*

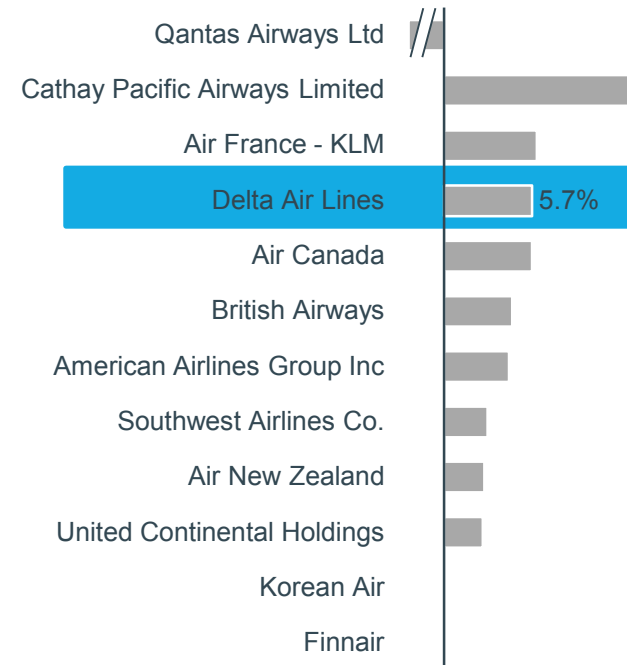
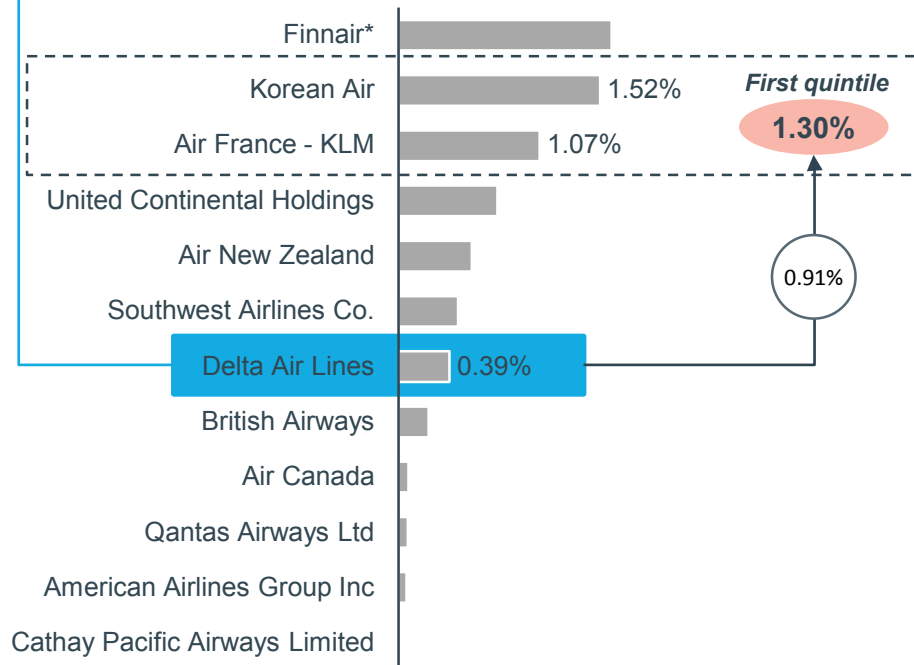
$$\text{Potential financial uplift [\%]} = \frac{\text{Savings per year, difference to First Quintile [\%]} * \text{Estimated energy cost [\$]}}{\text{EBIT [\$]}}$$

The difference between these values and the first quintile average is the *Savings per year, difference to First Quintile [%]*; i.e. Delta Airlines have a (1.30% - 0.39%) = **0.91%** difference.

This percentage difference is then multiplied by the company's estimated energy cost; i.e. for Delta, 0.91% x \$13.8bn = **\$126m**

The product is then divided by the company's EBIT; i.e. for Delta, \$126m / \$2.2bn = **5.7%**

This result is the *Potential financial uplift [%]*



# This is an example of how *Energy efficiency performance metric, Potential financial uplift if reach second quintile* is shown and calculated



## Potential financial uplift if reach second quintile

*Savings per year, difference to Second Quintile [%] = Second Quintile savings per year [%] – Savings per year [%]*

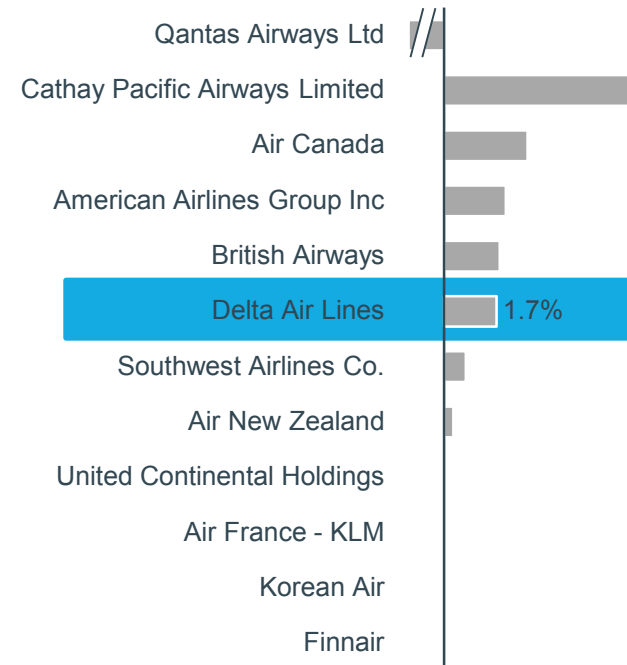
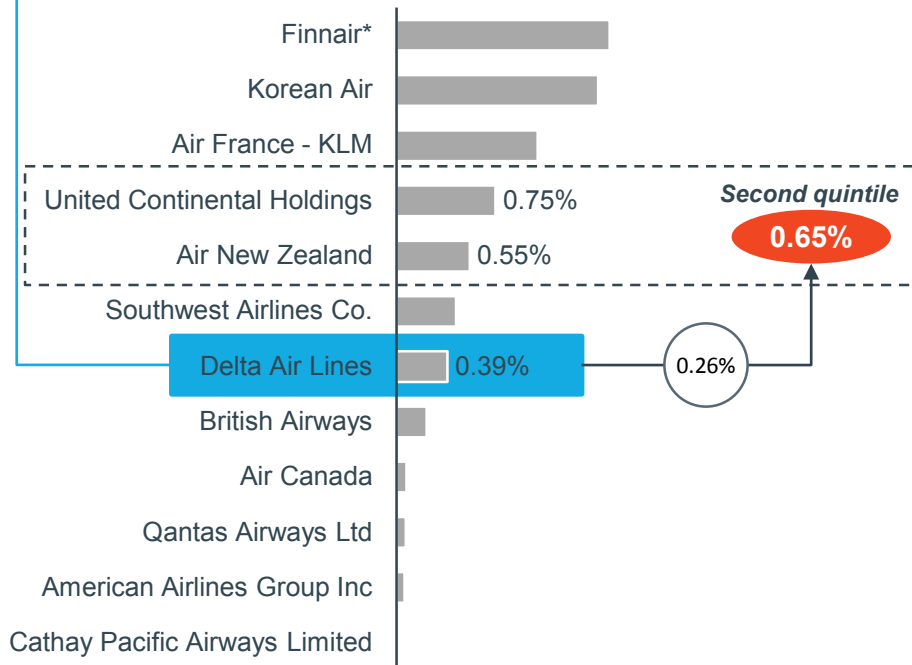
$$\text{Potential financial uplift [\%]} = \frac{\text{Savings per year, difference to Second Quintile [\%]} * \text{Estimated energy cost [\$]}}{\text{EBIT [\$]}}$$

The difference between these values and the first quintile average is the *Savings per year, difference to Second Quintile [%]*; i.e. Delta Airlines have a (0.65% - 0.39%) = **0.26%** difference.

This percentage difference is then multiplied by the company's Estimated energy cost; i.e. for Delta, 0.26% x \$13.8bn = **\$37m**

The product is then divided by the company's EBIT; i.e. for Delta, \$37m / \$2.2bn = **1.7%**

This result is the *Potential financial uplift [%]*





# Notes on *Energy efficiency performance metrics*

## ▪ Savings per year

Source:

- **Annual monetary savings from implemented energy efficiency activities:** CDP Climate Change Questionnaire CC3.3b, average of 2013 and 2014 responses
- **Energy cost (estimate)**
  - Based on mid-point of reported energy cost range (see notes on Energy cost above) and OPEX (see notes on OPEX above)

Notes on data point:

- Where energy cost ranges were not available (i.e. companies did not respond to CC11.1), the highest range of energy cost in the sector was used to calculate energy savings implemented per year
- Within each sector, companies that reported annual monetary savings from implemented energy efficiency activities were ranked in order from highest to lowest, and sorted into quintiles, giving the average performance in the 1<sup>st</sup> and 2<sup>nd</sup> quintiles

Notes on classifying 'energy efficiency' activities

- Activities were classified as energy efficiency based on descriptions and categories reported by each company.
- Initially, a sweep of all reported initiatives for all companies was undertaken using this process described in the figure below.
- After narrowing down the companies included in the index, it was possible and necessary to manually perusing description text for those companies to determine if the activity was indeed energy efficiency or not. This manual process often identified activities that were classified slightly differently and/or had a short description that was not picked up by the initial sweep, but were indeed eligible activities.

### Initial sweep criteria



## ▪ Potential financial uplift

Source:

- **EBIT:** MintGlobal financial database, average of 2013 and 2014 responses





# Methodology for companies benchmarking

General rating, scores and metrics

Calculating the metrics

**Data quality**



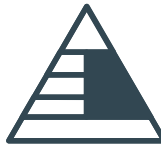
## The energy data used for the analysis was sourced from voluntary company reporting and therefore presents some limitations

Analysis undertaken was limited by the availability and quality of company data. Energy data used in the analysis was primarily sourced from CDP, complemented with other voluntary company reporting where required.

This leads to the following potential limitations:

- Some companies do not report on all metrics;
- it is also likely that some reporting is incomplete;
- energy costs reported as a range<sup>#</sup>, which could lead to high margins of error in estimating energy cost from low energy cost ranges;
- Variable quality of responses, both over time and between companies in the same year;
- Emissions reduction opportunities reported by companies were classified as energy efficiency based on descriptions and categories reported by each company - this qualitative data may have lead to inaccurate classifications of energy efficiency activities.

<sup>#</sup> Given that we use the midpoint of the range, the uncertainty around calculated energy costs diminishes as the range increases. For example, in the '5-10%' range, the midpoint is 7.5%, and so there is an uncertainty of about 33% on the energy costs (if the company's costs are actually 5% or 10%). In the '40-45%' range, the uncertainty decreases to just 6% with a midpoint of 42.5% and possible extremes of 40% and 45%.



## Notes on the treatment of low quality/uncertain data treatment (1/2)

In the indices, the recommendation for some companies is a hollow circle. This indicates that 'results (are) provisional due to data uncertainty'. In these cases, the company has one or more of the following four issues. These are indicated as described

### **Not Reported – “NR”**

Where no energy efficiency activities were described, the data point was marked with “NR”. It was assumed that this corresponded to 0 activity.

### **Not Quantified – “NQ”**

Where energy efficiency activities were described, but no monetary savings were given, the data point was marked with “NQ”. It was assumed that this corresponded to 0 activity, but was augmented where possible with emissions reduction performance. See [this section](#) for more information.

### **Insufficient Data – “ID”**

Where less than 3 years of continuous usable data was available to undertake the analysis, the data point was marked with “ID”. The data points included Revenue, OPEX, EBIT, Energy use and, where applicable, units of production.



## Notes on the treatment of low quality/uncertain data treatment (2/2)

### Uncertain data – “x.xx%”

In some cases the description of the opportunity lacked detail of the activities undertaken and/or a majority presented as a target rather than an achieved result. Here the data point was highlighted red in the benchmark, to denote it as “uncertain data”

- This treatment was given to some/all of the following company’s responses in the given year: Ahlstrom Corporation (2013); China Steel (2013 & 2014); Finnair (2013 & 2014); Mitsui Chemicals, Inc. (2014); and Teijin Ltd. (2013 & 2014).



## In some cases, emissions reduction from energy efficiency activities is incorporated into the General Rating

- Emissions reduction from energy efficiency activities

$$\text{Emissions reduction [\%]} = \frac{\text{Emissions reduction from EE [mt CO}_2\text{e]}}{\text{Gross global Scope 1 + 2 emissions [mt CO}_2\text{e]}}$$

Company	General Rating	Energy cost resilience		Energy productivity outcome		Energy efficiency performance			Additional information
		10%	10%	20%	15%	15%	15%	15%	
		Energy cost range, % opex	Profitability, EBIT / Revenue	Energy productivity, tonne/GJ	Energy productivity, Average annual % change (earliest to latest)	Savings per year, % est. energy cost	Potential financial uplift (% EBIT) if reach top quintile	Potential financial uplift (% EBIT) if reach second quintile	Emissions reduction from energy efficiency activities, % gross scope 1 & 2 emissions
\$ Hyundai Steel	80%	5-10%	7.3%	0.19	-6.4%	2.36%	0.0%	0.0%	0.78%
Arcelor Mittal	74%	5-10%	6.1%	0.15	-5.2%	0.52%	0.4%	0.0%	0.27%
China Steel	59%	25-30%	8.0%	0.06	5.0%	0.49%	1.2%	0.1%	0.73%
JSW Steel	58%	35-40%	11.4%	0.07	ID	0.88%	0.0%	0.0%	4.72%
Tata Steel	25%	50-55%	6.6%	0.13	-4.5%	0.20%	5.1%	2.4%	1.40%
Cia. Siderurgica Nacional - CSN	21%	40-45%	17.7%	0.04	ID	NQ	1.6%	0.9%	0.30%
United States Steel Corporation	20%	5-10%	-2.2%	0.06	-2.9%	NQ	-1.4%	-0.1%	1.99%
POSCO	14%	15-20%	4.9%	0.05	-2.0%	0.07%	2.8%	1.5%	0.05%





## This additional information is used only where there is a 'Not Quantified' (NQ) data point

In some cases a company reported energy efficiency activities in the CDP Climate Change Questionnaire CC3.3b, but did not quantify financial savings, but the emissions reduction (mtCO<sub>2</sub>e) instead.

When this occurred, the rating assigned to that data point was determined according to the % emissions reduction of their activities, relative to the performance of others in the sector, up to a maximum of 50%.

The high- and low-performance ceiling values were set as the 80th and 50<sup>th</sup> percentile of the emissions reductions for the sector, respectively.

Company	Metrics			Underlying scores
		Savings per year, % est. energy cost	Potential financial uplift (% EBIT) if reach top quintile	Savings per year, % est. energy cost
Hyundai Steel	80%	2.36%	0.0%	100%
Arcelor Mittal	74%	0.52%	0.4%	83%
China Steel	59%	0.49%	1.2%	76%
JSW Steel	58%	0.88%	0.0%	100%
Tata Steel	25%	0.20%	5.1%	6%
Cia. Siderurgica Nacional - CSN	21%	NQ	1.6%	0%
United States Steel Corporation	20%	NQ	-1.4%	50%
POSCO	14%	0.07%	2.8%	0%

**Low-performance ceiling > Company performance > high-performance ceiling** (not shown)

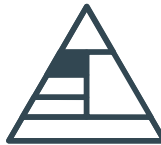
When a company's emissions reduction fall between the low- and high-performance ceilings, a score of **25%** is assigned.

**Company performance < Low-performance ceiling**

Cia. Siderurgica Nacional – CSN did not quantify financial savings from it's energy efficiency activities, but did quantify the emissions reduction. Their emissions reduction however are below the low-performance ceiling (0.76%). As such, it scores **0%**.

**Company performance > High-performance ceiling**

United States Steel Corporation did not quantify financial savings from it's energy efficiency activities, but did quantify the emissions reduction. Their emissions reduction are above the high-performance ceiling (1.75%). As such, it scores **50%**.



## Notes on *Emissions reduction from energy efficiency activities*

### ▪ Emissions reduction from energy efficiency activities

Source:

- **Estimated annual CO<sub>2</sub>e savings (metric tonnes CO<sub>2</sub>e) from implemented energy efficiency activities:** CDP Climate Change Questionnaire CC3.3b, average of 2013 and 2014 responses
- **Gross global Scope 1 + 2 emissions, metric tonnes:** CDP Climate Change Questionnaire CC8.2 + CC8.3, average of 2013 and 2014 responses

The sectors and companies where this was used:

- **Paper:** Holmen
- **Steel:** Cia. Siderurgica Nacional - CSN & United States Steel Corporation
- **Chemicals:** Dow Chemical Company & Wacker Chemie AG
- **Construction materials:** Cementir Holding SpA & HeidelbergCement AG

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In some cases there was a significant discrepancy in the emissions savings reported relative to the magnitude of annual monetary benefit and/or energy savings (if reported in description). Here the emissions data was excluded from the calculation of emissions savings for that company presented in the “Additional Information” column.

This treatment was given to some/all of the following company’s responses in the given year: Air Canada (2014); Arcelor Mittal (2014); and Svenska Cellulosa Aktiebolaget (2013). Furthermore, one opportunity disclosed by Hyundai Steel in 2014 was excluded from both annual monetary savings and emissions reduction owing to suspected erroneous reported.

# In depth presentation of guide for investors content

01

What is energy productivity?  
Why is it relevant to investors?

02

Identify sectors where energy productivity is important

03

Identify companies with which to engage. Measure their performance against competitors

04

**Steps to engage with companies**

05

Tools and resources

## Two key lines of questioning can be used when engaging with company boards

### 1. Clarify current performance

- a) Are you reporting on energy-related issues comprehensively and accurately in public reports?
- b) How do your current efforts to improve energy efficiency and energy productivity compare with your peers? Are legitimate factors producing a lower-than-expected result?

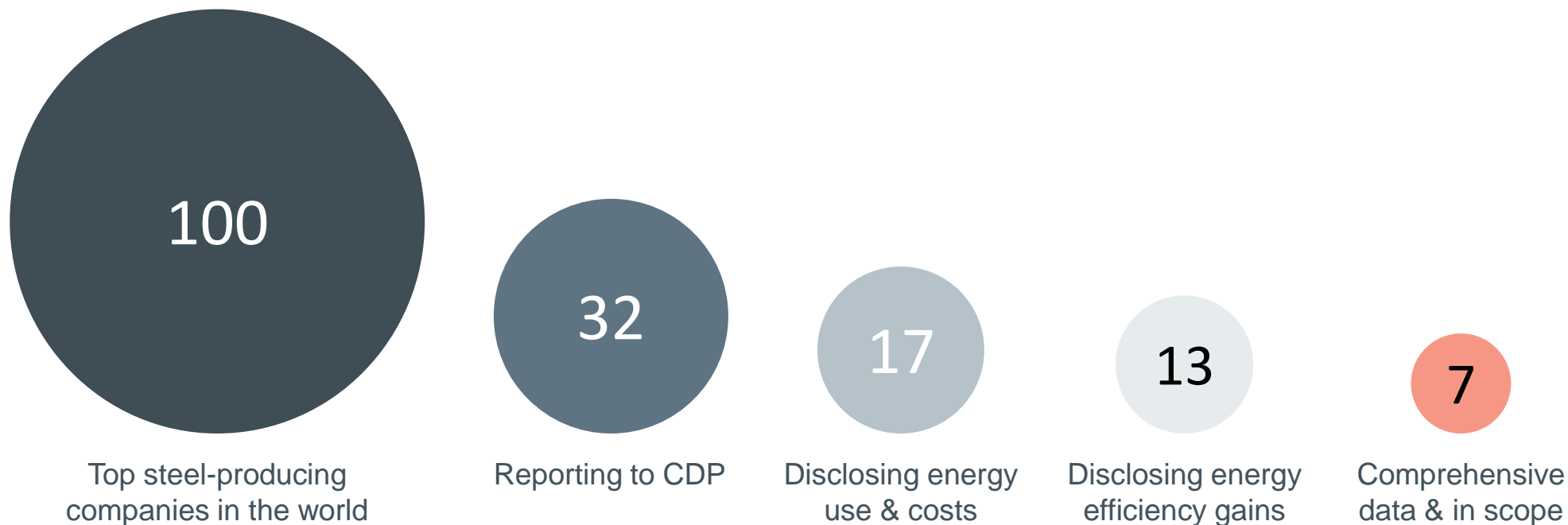
### 2. Discuss how performance can be improved in the future

- a) Are your future plans to improve energy efficiency and energy productivity ambitious enough?
- b) What processes do you have in place to ensure your plans are implemented effectively?

## 1a. Are you reporting on energy-related issues comprehensively and accurately? (1/6)
















Very few companies report enough data to allow a comprehensive comparison with their peers. This was found to be the case even in a sector as energy- and emissions-intensive as Steel. As depicted below, of the top 100 steel producing companies, only 13 provided enough data to undertake all aspects of the analysis.

Analysis was undertaken for 7 companies in the Steel sector as some of these companies produce significantly different products, e.g. stainless steel, and are therefore not comparable with crude steel producers.



## 1a. Are you reporting on energy-related issues comprehensively and accurately? (2/6)

Our analysis also identifies companies which could improve on their reporting, depicted in the sector indices by hollow circles. The criteria for when this occurs are described in detail in the [data quality section](#).

Airlines	
Company	Rating
 United Continental Holdings	83%
 Finnair	74%
 Southwest Airlines Co.	70%
 Air New Zealand	59%
 Air France - KLM	41%
 Korean Air	39%
 Air Canada	37%
 British Airways	35%
 Delta Air Lines	34%
 Qantas Airways Ltd	31%
 Cathay Pacific Airways Limited	14%
 American Airlines Group Inc	13%
 7 companies with incomplete/insufficient data provided to CDP to conduct analysis (Aer Lingus Group PLC, Asiana Airlines, easyJet, Gol Linhas Aereas Inteligentes S.A., TAM S.A., Virgin Australia Holdings, WestJet Airlines Ltd.).	
 All other companies did not respond to CDP	
 5 companies that were reviewed but excluded from analysis (Air Partner Plc, Hong Kong Aircraft Engineering, IBERIA, International Consolidated Airlines Group, S.A., SAS).	

### Insufficient data



*Results provisional due to data uncertainty.* Request additional data to confirm rating: One or more metric with low quality or incomplete data reported; request for better data is recommended before validating results



*Data provided is insufficient to conduct analysis;* require more information: Company provided insufficient information to assess energy productivity and efficiency performance. Given the materiality of potential risks and opportunities, a request for more information is recommended

## 1a. Are you reporting on energy-related issues comprehensively and accurately? (3/6)

**Some key elements that characterize good reporting are:**

### **Comprehensive**

Energy-related data is disclosed at the most granular level available that is relevant to the company activities. CDP data points and metrics (described below) are a good guide of the level of reporting.

Data source	CDP reporting metrics	Other potential metrics*
Minimum data provision	<ul style="list-style-type: none"><li>• Energy cost range</li><li>• Energy use</li></ul>	<ul style="list-style-type: none"><li>• Energy bills (\$)</li><li>• Energy productivity</li></ul>
Good data provision (additional to above)	<ul style="list-style-type: none"><li>• Energy cost savings from implemented energy efficiency activities</li></ul>	<ul style="list-style-type: none"><li>• Energy savings achieved over a given period, in energy and/or financial terms (absolute or percentage)</li></ul>



## 1a. Are you reporting on energy-related issues comprehensively and accurately? (4/6)

**Some key elements that characterize good reporting are:**

### **Consistent**

- > Data provided is for the same scope of operations as financial data and is in appropriate units.
- > Data is consistent in scope year-on-year, or an explanation of why not is provided.



## 1a. Are you reporting on energy-related issues comprehensively and accurately? (5/6)

**Some key elements that characterize good reporting are:**

### **Accurate**

- > Recognizing the importance of timely data disclosure to its relevance, companies should consider taking a leadership approach and making key reporting characteristics available as soon as practicable.
  - > Some characteristics could include head-line figures such as current and recent change in energy productivity or savings from energy efficiency activities.
- > Descriptions of activities have sufficient detail to provide confidence.
- > Follow the reporting guidelines. For example, make sure that only energy efficiency initiatives that were implemented in the reporting year are reported and are completed projects rather than aspirational targets.
  - > *Specifically for CDP reporting, CC3.3b:* Energy efficiency activity descriptions provide information on nature of the activity, including the processes/ equipment involved, as well as whether it is Scope 1, 2 or 3.
- > Data has been suitably audited/assured, at least through a robust internal process, and this process is disclosed

# 1a. Are you reporting on energy-related issues comprehensively and accurately? (6/6)

## Some examples of acceptable and sub-optimal reporting of energy efficiency activities are:

Acceptable reporting
<b>Few descriptive activities disclosed</b>
<p>“Implemented a variety of projects across locations to improve the electrical efficiency and thermal efficiency of operations”</p>
<b>Many individual activities with description of technology/action</b>
<ul style="list-style-type: none"> <li>• “Bag filter upgrades”</li> <li>• “installation of variable speed compressors”</li> <li>• “Replacement of old quarry vehicles”</li> </ul>
<b>Lots of detail on a few large activities, with others aggregated</b>
<p>“Actions resulting from site based carbon reduction plans, these concentrate on compressed air leak detection and fixing, improved control and efficiency of motors and drives, process optimisation, monitoring and measuring. All these activities have a positive contribution to the overall reduction in carbon emission targets ABs1, ABs2 and Int1. This project is a rolling 12 months with a six month internal review on the carbon emission reductions achieved by actions taken. This is currently voluntary in respect to legislation but is likely to fall into the Energy Savings Opportunity Scheme in 2015. Savings will be made in Scopes 1 and 2.”</p>

Sub-optimal reporting
<b>No detail of technology/action implemented</b>
<ul style="list-style-type: none"> <li>• “Process efficiency improvements”</li> <li>• “Reduction in electricity use”</li> </ul>
<b>Reporting prospective activities, or goals, with no indication of it being achieved.</b>
<p>“...launched a program which aims at approximately 2 per cent savings annually in jet fuel consumption. This equates to saving approximately 17 million kilograms of jet fuel annually (2013 figure). Due to commercial reasons savings are counted by using average fuel price Voluntary measure, expected to be continuous project These savings affect Scope 1 emissions”</p>

Description of reason
Example responses

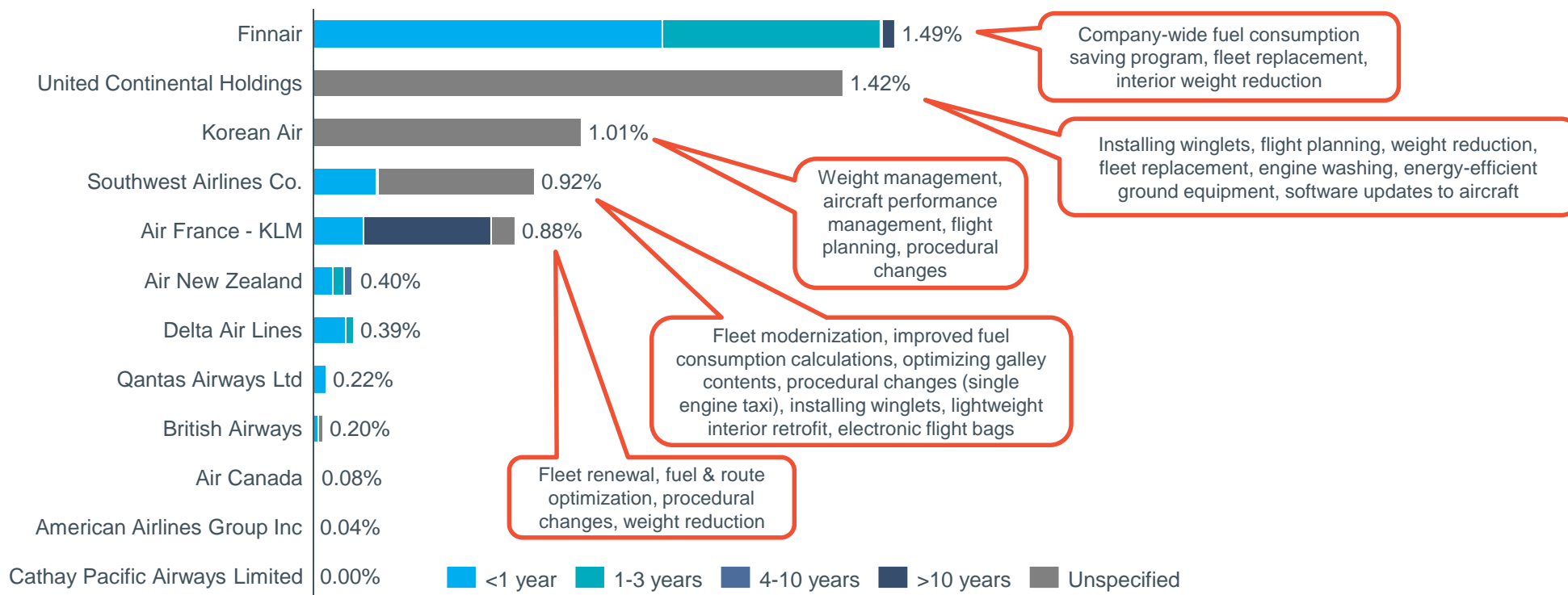
## 1b. How do your current efforts to improve energy efficiency and energy productivity compare with your peers ? (1/2)

- > How is the company's current and past performance compared to their peers?
  - > What kinds of improvements have they achieved in the past?
  - > Clarify their performance in our index – are legitimate factors producing a lower-than-expected result? For example:
    - > Large differences in energy use may be explained by how much a production process is vertically integrated; i.e. automobile manufacturers that manufacture engines in-house rather than purchased externally
    - > There may be operational differences that affect energy intensity; i.e. airlines that operate a significant share of short-haul versus long-haul flights.

## 1b. How do your current efforts to improve energy efficiency and energy productivity compare with your peers ? (2/2)

An overview of activities implemented by all companies can help identify whether a company has considered all activities that can contribute to energy productivity. For example, the graph below presents energy efficiency improvements that airline companies included in the analysis have implemented over the past two years. Similar information prepared for all companies across each sector is available in the [sector-specific results](#).

Energy savings shown as percentage of energy cost, colored by payback period, Energy efficiency improvements detailed in callout boxes



## 2a. Are your future plans to improve energy efficiency and energy productivity ambitious enough?

Does the company have ambitious plans to improve their energy efficiency/productivity?

- > Have they developed specific energy productivity/efficiency targets?
- > Are those targets ambitious compared to their peers/our benchmark?
  - > There are many initiatives and platforms for companies to make ambitious commitments.
  - > For example, the Alliance to Save Energy advocates a goal of doubling energy productivity in the U.S. by 2030
  - > The Lima-Paris Action Agenda is but one platform for companies to register their commitments towards a range of sustainability issues.

Further information on company targets is available in the CDP responses, specifically CC 3.1.

## 2b. What processes do you have in place to ensure your plans are implemented properly? (1/3)

Investors can make several suggestions to companies around improving internal energy management practices. These may include:

- 1. Collecting and managing energy data**
- 2. Driving greater energy productivity from the top**
- 3. Establishing a supportive culture**
- 4. Valuing energy efficiency projects**
- 5. Setting ambitious goals and targets**

Implementing these practices can help ensure companies take advantage of all profitable opportunities available to them and see continuous improvement in their energy productivity and energy efficiency performance. Descriptions of these practices are provided on the following pages.

## 2b. What processes do you have in place to ensure your plans are implemented properly? (2/3)

### 1. Collecting and managing energy data

This involves regular, systematic collection and analysis of energy data to improve the company's understanding of their energy productivity in the first instance and provide greater transparency and better reporting to shareholders.

### 2. Driving greater energy productivity from the top

Strong, visible senior leadership with active oversight, support and accountability for energy management to send positive signals to shareholders and priorities future business decisions.

### 3. Establishing a supportive culture

Provide a positive perception of energy efficiency that is well-aligned across the organization and included in the core business strategy, corporate policies or operational guides, as an effective mechanism for driving greater energy productivity.

## 2b. What processes do you have in place to ensure your plans are implemented properly? (3/3)

### 4. Valuing energy efficiency projects

This could include comprehensive and appropriate financial evaluation of energy efficiency projects to allow them to compete fairly with other investment opportunities. This involves recognizing the wider benefits of these projects such as reduced energy and climate risks, as well as improvements in productivity or working environments.

### 5. Setting ambitious goals and targets

Implementing public 'specific, measurable, assignable, realistic and time related' (SMART) energy efficiency goals or targets across the organization's business units.



## Suggested energy management practices are provided based on previous work and literature review (1/2)

The energy management practices that investors can suggest to companies are a result of previous research by ClimateWorks Australia and a review of available literature on the topic.

ClimateWorks Australia has previously undertaken research into the topic of industrial energy efficiency through its [Tracking Progress: Special Report on factors influencing large industrial energy efficiency](#) report. This involved in-depth interviews with large industrial companies in Australia, focusing on the factors influencing large industrial companies to improve their energy efficiency. This research found that internal practices appear to have a strong influence on energy efficiency. An extract from this report showing the three highest impact practices and additional savings achieved is shown below.

(Extract of Exhibit 6.55 from [Tracking Progress: Special Report on factors influencing large industrial energy efficiency](#))

Percentage of additional savings achieved for companies with a high score for the practice compared to companies with a low score



## Suggested energy management practices are provided based on previous work and literature review (2/2)

Appreciating the global focus of this analysis, these findings were augmented by a literature review. The most pertinent sources are listed below.

- > Prindle, WR 2010, *From shop floor to top floor: best business practices in energy efficiency*, Pew Center on Global Climate Change, viewed 01 June 2015, [http://www.c2es.org/docUploads/PEW\\_EnergyEfficiency\\_FullReport.pdf](http://www.c2es.org/docUploads/PEW_EnergyEfficiency_FullReport.pdf)
- > CDP and WWF 2013, *The 3 percent solution: Driving profits through carbon reduction*, CDP, viewed 01 June 2015, <https://www.cdp.net/CDPResults/3-percent-solution-report.pdf>
- > Confederation of British Industry's (CBI) 2013, *Shining a light: Uncovering the business energy efficiency opportunity*, CBI, viewed 01 June 2015, <http://news.cbi.org.uk/business-issues/energy-and-climate-change/publications/shining-a-light/>
- > Carbon Trust 2010, *The business of energy efficiency*, Carbon Trust, viewed 01 June 2015, <https://www.carbontrust.com/media/135418/cta001-business-of-energy-efficiency.pdf>
- > Ismail, N and Littlefield, L 2011, *Energy intelligence: Driving optimization with visibility*, Aberdeen Group, viewed 01 June 2015, <http://www.blog.criterio-sostenible.com/wp-content/uploads/2011/08/2011-08-ABERDEEN-Energy-Intelligence.pdf>
- > Energy Efficiency Financial Institutions Group (EEFIG) 2015, *Energy efficiency - the first fuel for the EU economy: How to drive new finance for energy efficiency investments*, EEFIG, viewed 01 June 2015, [http://www.unepfi.org/fileadmin/documents/EnergyEfficiency-Buildings\\_Industry\\_SMEs.pdf](http://www.unepfi.org/fileadmin/documents/EnergyEfficiency-Buildings_Industry_SMEs.pdf)
- > Institute for building efficiency 2013, *2013 energy efficiency indicator survey: Global summary*, Institute for building efficiency, viewed 01 June 2015, [http://www.institutebe.com/InstituteBE/media/Library/Resources/Energy%20Efficiency%20Indicator/061213-IBE-Global-Forum-Booklet\\_I-FINAL.pdf](http://www.institutebe.com/InstituteBE/media/Library/Resources/Energy%20Efficiency%20Indicator/061213-IBE-Global-Forum-Booklet_I-FINAL.pdf)
- > McKinsey & Company 2010, *Energy efficiency: A compelling global resource*, McKinsey & Company, viewed 01 June 2015, <http://mckinseysociety.com/energy-efficiency-a-compelling-global-resource/>

# In depth presentation of guide for investors content

01

What is energy productivity?  
Why is it relevant to investors?

02

Identify sectors where energy productivity is important

03

Identify companies with which to engage. Measure their performance against competitors

04

Steps to engage with companies

05

**Tools and resources**

## Tools and resources have been updated and will include detailed results for each sector

The 6 sectors are:



**Airlines**



**Automobiles**



**Paper** (only, from Paper & Forest Products)



**Steel**



**Chemicals\*** (Diversified and Commodity Chemicals)



**Construction Materials\***

\* These sectors are non homogenous and were treated slightly differently.

For each sector, the following has been covered:

- > Summary of findings,
- > Energy cost resilience,
- > Energy productivity outcome,
- > Energy efficiency performance, and
- > Energy efficiency opportunities implemented by companies in the sector



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