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# Decarbonising portfolios Aligning net zero pathways in corporate credit portfolios

For professional investors only

15 June 2021



## Your presenter today:



Tammie Tang Portfolio Manager

# Agenda



Tremendous momentum towards Net Zero commitments



Approaches to aligning net zero pathways





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Section 1 The forces behind Net Zero commitments





# Force 1 – Country commitments

#### The race to Net Zero started in Paris in 2015 .. But has only recently got the Green light



Net Zero is no longer a 2050 distant dream, its impact is here today

Source: Columbia Threadneedle Investments, as at March 2021.

In highlighted countries that announced higher targets in 1Q21. \* MS estimations: implied annual change from 2018-2030



# Force 2 – Corporate commitments

- Growing momentum across all sectors (and all sectors will be impacted)
- Governments, investors and customers are all creating pressure on companies to make net zero commitments, which we believe will lead to an explosion in net zero commitments
  - Governments through carbon taxing and carbon pricing schemes
  - Other companies (customers) through supply chain, carbon intensity of service or product becomes a decision factor
  - Investment industry, Funds may start selling the worst carbon emitters in absolute but also relative terms
  - End customer decision to buy a product or service impacted by carbon intensity
- Over 1,500 companies are now taking action

#### Growing momentum across all sectors



#### Growing corporate momentum



Source: CDP and SBTI, as at June 2021.

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# Force 3 – Asset Owners

- Rising regulations on sustainable finance, particularly in EU and UK (US following suit), are imposing ESG disclosure requirements on asset managers
- Also clients are also increasingly demanding the investment industry to commit to net zero
- Net zero asset managers Initiative signees commit to investing aligned with net zero by 2050, it has 87 signatories with US\$37 trillion assets under management
- 37 Asset owners with US\$5.7 trillion AUM signed up to the Net Zero Asset Owners Alliance which additionally commits to establishing intermediate targets every five years
- This will force companies to reduce emissions or risk being sold!



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# What it takes to achieve Net Zero Radical sector decarbonisation, Now!

To reach the 1.5 C goal, the world needs to reduce net emissions by 23 GtCO<sub>2</sub> by 2030, which it is approximately half current levels





# Interim targets

#### Sovereign targets

	~	Net Zero target	Interim emissions reduction targets									
	% global emissions	Year	Target	Target Year Baseline		Implied annual change going forward*						
UK	1%	2050	-78%	2035	1990	-5.5%						
EU	8%	2050	-55%	2030	1990	-4.0%						
US	15%	2050	-50%	2030	2005	-4.8%						
Japan	3%	2050	-46%	2030	2013	-4.0%						
Canada	2%	2050	-40%	2030	2005	-4.5%						
China	30%	2060	Peak emissions	2030	2005							
India	7%	n/a	-33% (intensity)	2030	2005							

#### Asset owner targets

- Net Zero Asset Owner Alliance
- Target -16 to -29% emissions reduction by 2025

Source: Columbia Threadneedle Investments, as at March 2021.

In highlighted countries that announced higher targets in 1Q21. \* MS estimations: implied annual change from 2018-2030



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# Section 2

# Approaches to align Net Zero pathways and decarbonising portfolios





# Evaluating forward carbon trajectories in existing portfolio holdings



Utilise data lake and advanced analytics



Extract carbon trajectory estimates with confidence bands



Supplement with in-depth thematic research to assess underlying historical and forward looking drivers

# Global Investment Grade portfolio Natural decline



#### **Total carbon emissions NNAR forecasts**



 Across 100,000 scenarios\*, 2025 forecasts indications

#### Median Forecast Scenario:

25% natural decline in total carbon emissions

#### **90th Percentile**

 31% natural decline in total carbon emissions

Source: Columbia Threadneedle Investments, as at April 2021. For illustrative purposes only. Using +10 years data (MSCI, CDP, Bloomberg) for +8800 companies and mapped to existing portfolios. Ran a Neural Network model, using +50 input variables and 100,000 scenarios

# Total carbon emissions



# Utilities: Total Carbon Emissions NNAR Forecasts

## **Utilities: Total carbon emissions NNAR forecasts**

#### **Median Forecast**

Utilities : 19% decline in total carbon emissions

#### **90th Percentile**

Utilities : 29% decline in total carbon emissions

## **Energy: Total carbon emissions NNAR forecasts**



#### Energy: Total Carbon Emissions NNAR Forecasts

#### **Median Forecast**

Energy: 11% decline in total carbon emissions

#### **90th Percentile**

• Energy: 13% decline in total carbon emissions

#### COLUMBIA THREADNEEDLE INVESTMENTS

# Total carbon emissions Sector level aggregates



 Across 100,000 scenarios\*, 2025 forecasts indications

#### **Median Forecast Scenario:**

- 25% natural decline in total carbon emissions
  - 19% decline in total carbon emissions within Utilities
  - 11% decline in total carbon emissions within Energy

#### 90th Percentile

- 31% natural decline in total carbon emissions
  - 29% decline in total carbon emissions within Utilities
  - 13% decline in total carbon emissions within Energy



# Total carbon emissions Sector level aggregates



#### **Total Carbon Emissions**

Source: Columbia Threadneedle Investments, as at April 2021.



# Total carbon emissions Sector level aggregates



Utilities	9.51	77	95
Energy	1.98	7.3	00
Industrials	7.18	4.6	
Materials	0.88	3.8	
Communication Services	6.18	1.8	
Consumer Discretionary	2.29	1.7	
Consumer Staples	2.76	1.7	
Real Estate	4	0.7	
Financials	17.28	0.5	
Health Care	6.71	0.5	
Information Technology	3.54	0	

Port Wgt 🛊

85% of Portfolio TCE

Port TCE%

Source: Columbia Threadneedle Investments, as at April 2021.



# Top 10 total carbon emissions Issuers

#### Portfolio Total Carbon Emissions Top 10 Emitters



AMERICAN ELECTRIC POWER COMPANY, INC.
DUKE ENERGY CORPORATION
E.ON SE
EMERA INCORPORATED
ENGIE SA
FIRSTENERGY CORP.
GLENCORE PLC
NISOURCE INC.
PPL CORPORATION
THE SOUTHERN CONTRACTOR

Name	Ticker	Sector	Port Wgt 🌻	Port TCE%
ENGIE SA	ENGI FP	Utilities	0.8	15.7
NISOURCE INC.	NI US	Utilities	1.07	14.1
DUKE ENERGY CORPORATION	DUK US	Utilities	0.55	8.8
AMERICAN ELECTRIC POWER COMPANY, INC.	AEP US	Utilities	0.33	7.4
PPL CORPORATION	PPL US	Utilities	0.39	5.9
THE SOUTHERN COMPANY	SO US	Utilities	0.26	4.3
EMERA INCORPORATED	EMA CN	Utilities	0.17	3.9
FIRSTENERGY CORP.	FE US	Utilities	0.26	3.2
E.ON SE	EOAN GR	Utilities	0.89	2.9
GLENCORE PLC	GLEN LN	Materials	0.35	2.4

Source: Columbia Threadneedle Investments, as at April 2021. For illustrative purposes only. The mention of any specific stocks or bonds is not a recommendation to deal.



# Top 10 total carbon emissions Issuers



Source: Columbia Threadneedle Investments, as at April 2021. For illustrative purposes only. The mention of any specific stocks or bonds is not a recommendation to deal.









# Total carbon emissions Additional data – Top 10 Issuers

Ticker 崇	ISIN 🗍	Issuer 🖕	CDP Base Yr ∳ Abs Tgt	CDP Base Yr Emission Abs Tgt	CDP Abs Tgt Comments	CDP Emission Scope Tgt	CDP Tgt Yr ≑ Abs Tgt	Climate Change Policy
AEP US	US0255371017	AMERICAN ELECTRIC POWER	2000	167		Scope 1	2050	true
DUK US	US26441C2044	DUKE ENERGY CORP	2005	138	The goal was met in 2015 (our 2015 intensity was 0.426 metric tonnes per MWh)). A significant shift in generation from coal to natural gas due to coal unit retirements and lower natural gas prices was a significant contributor to meeting the goal in 2015.	Scope 1	2030	true
EMA CN	CA2908761018	EMERA INC	2005	10.2		Scope 1	2030	true
ENGI FP	FR0010208488	ENGIE	2012	142.767696	The GHG emissions reported to the energy production amount to 393 (tCO2 eq / GWheqs) in 2016 against 443 in 2012. The progress towards the -20% objective (or 354tCO2 eq / GWheqs) has been calculated as follows (443-393)/(443-354)	Scope 1+2 (location- based)	2050	true
EOAN GR	DE000ENAG999	E.ON SE	2016	83.428912	Our emission reduction targets refer to the base year 2016. Therefore the state of completion by end of 2016 amounts to 0% so far.	Scope 1+2 (market- based) +3 (u	2030	true
FE US	US3379321074	FIRSTENERGY CORP	2005	86.403128		Scope 1	2045	true
GLEN LN	JE00B4T3BW64	GLENCORE PLC	1990	0.040299	Nickel site in Canada: GHG intensity has increased since 2014, especially as mining energy reduction efforts like Ventilation-on-Demand (VOD) haven't fully compensated the increased energy intensity of the depleting ore body.	Scope 1+2 (location- based)	2030	true
NI US	US65473P1057	NISOURCE INC	2005	18.369782		Scope 1	2025	true
PPL US	US69351T1060	PPL CORP	2010	62.577296		Other, please specify: Scope 1	2050	true
SO US	US8425871071	SOUTHERN CO/THE						true

Source: Columbia Threadneedle Investments, as at April 2021. For illustrative purposes only. The mention of any specific stocks or bonds is not a recommendation to deal.



# Median forecasts

#### **Illustrative portfolios**

- Global IG: -25%
- GBP IG: -39% (NonFins) -48% (Fins)
- European High Yield : 7%

#### **Considerations**

#### Portfolio composition

Portfolio carbon vs benchmark



# Total carbon emissions Illustrative: EU HY Portfolio Sector level aggregates



**Total Carbon Emissions** 

Source: Columbia Threadneedle Investments, as at April 2021.



# What it takes to achieve Net Zero Radical sector decarbonisation, Now!

Achieving net-zero will require radical sector decarbonization: Power (-90%), Industry (-60%), Transport (-70%), Buildings (-60%)



Carbon contribution

#### Forecast reduction



Source: IEA, as at May 2021.

# Active carbon reduction analysis (IG)



- Quantifying the carbon reduction through active divestment, without impairing financial objectives
- Within IG indices, meaningful carbon reduction can be achieved, as carbon contribution is concentrated among a smaller subset of issuers
- For example, zero weight in the top 10 index carbon intensity contributors, which comprise ~2% index NAV% could reduce carbon contribution by -34% (and -5 bps yield, presuming no credit reinvestment)

## Barclay's Global IG: Tickers ranked by average carbon intensity\*



Source: Columbia Threadneedle Investments as at 31 March 2021. Index used is the Barclays Global Corporate Index. \*Analysis may be run on other measures, including Total Carbon, Carbon footprint etc. The mention of any specific stocks or bonds should not be taken as a recommendation to deal.

# Active carbon reduction analysis (IG)



- Varying ways to approach active reduction trades (which to a large extent can produce similar outcomes, although specific details may vary slightly). One illustrative example:
  - Divesting the top 5 contributors (or -1.4% NAV) reduces portfolio carbon by -27% (and reduces yield by 5 bps)
  - Modest reduction in the above figures if proceeds reinvested at 'average' (or better) carbon intensity and yield

		Portfolio %	Bench %	Benchmar	k Carbon	Portfolio Carbon	Car	bon	Portfolio Yield	Benchmark	Portfolio	Bench CTD	Port DxS Tsv	Bench DxS Tsv
Top 10 tickers (by benchmark carbon intensity contribution)	Ticker			Intensity		Intensity	Inte	ensity	Contn	Yield Contn	CTD		,	<b>,</b>
Duke Energy	DUK		0.6%	0.4%	1!	5	16	3,868	0.02	0.01	0.09	0.04	9.82	4.30
Nevada Power Company	BRKHEC		0.1%	0.3%	1	L	4	3,481	0.00	0.01	0.01	0.04	1.25	3.91
Southern Co	SO		0.3%	0.3%	1	L	11	4,120	0.01	0.01	0.04	0.02	5.55	2.92
Virginia Electric and Power	D		0.2%	0.2%	-	1	7	3,068	0.01	0.01	0.03	0.02	3.31	2.53
Nextra Energy	NEE			0.2%		7		3,644		0.00		0.02		1.61
Indiana Michigan Power	AEP		0.3%	0.1%	-	1	10	4,439	0.01	0.00	0.04	0.02	5.02	1.92
Northern States Power	XEL			0.2%	(	ò		4,136		0.00		0.02		1.67
Entergy Arkansas	ETR			0.1%	4	ļ		3,171		0.00		0.01		1.14
DTE Electric Co	DTE			0.1%	4	ļ		3,751		0.00		0.01		0.77
Lafarge Holcim	LHNVX			0.1%	4	ļ		4,688		0.00		0.01		0.58
Top 10 total			1.4%	2.1%	7	,	48		0.05	0.05	0.22	0.20	25	21
As % total					34	%	27%		2%	39	6 3%	3%	3%	3%

- Front loading future carbon reduction trends
- Position consistently with issuer level research and portfolio construction process
- Starting position (i.e., portfolio may already sit significantly below benchmark)

# Other considerations





How did ... When are ... Where is ... Who is ... Can I ... Will there ... Should we ... How can ... Tell us ...





# Total Carbon Emissions Additional data – Top 10 Issuers

Field 🔶	DEFINITION
CDP Emission Scope Tgt	Scope(s) of emissions that the most ambitious absolute emissions reduction target relates to. The information is directly from the company's response to the CDP climate change information request.
CDP Base Yr Abs Tgt	Base year of the most ambitious absolute emissions reduction target. The information is directly from the company's response to the CDP climate change information request.
CDP Base Yr Emission Abs Tgt	Base year Greenhouse Gas (GHG) emissions of the most ambitious absolute emissions reduction target in millions of metric tonnes of carbon dioxide equivalent (MtCO2e). The information is directly from the company's response to the CDP climate change information request.
CDP Tgt Yr Abs Tgt	Target year of the most ambitious absolute emissions reduction target. The information is directly from the company's response to the CDP climate change information request.
CDP Abs Tgt Comments	Company's comment related to its completion trajectory for the most ambitious absolute emissions reduction target. The information is directly from the company's response to the CDP climate change information request.



# **NNAR**

A NN can be thought of as a "network of neurons" (nodes) which are organized in layers — analogous to the way information passes through neurons in humans. The advantage of a neural network is its adaptive nature which learns from the inputs provided and trains itself from the data (i.e. optimizing its weights for a better prediction).

A multilayer perceptron (MLP) is a class of feedforward artificial neural network. A MLP consists of at least three layers of nodes: an input layer, a hidden layer and an output layer. The outputs in one layer are inputs into the next layer. The first layer of the neural network receives the inputs. Coefficients (weights) are attached to these inputs and a linear combination of these weighted inputs are passed ("fed forward") to the hidden layer. The result from the hidden layer nodes are modified by a nonlinear activation function (in our case a sigmoid function) before being passed to the last output layer which has only one node representing the predicted value.

Activation functions are an important feature of a neural network since they decide whether a node should be "fired up" (ie. activated and whether the information that the node is receiving is relevant or should it be ignored). This is summarized in the general image below, along with a bias parameter which helps the model find a best fit for the given input data (think of it conceptually like an 'intercept' whose role allows us to shift the activation function which maybe critical for successful learning).

The connections in a NN are weighted and the weights are optimized using a backpropagation algorithm/learning rule (ie. a gradient descent algorithm). This algorithm iteratively and recursively changes the weights and biases to minimize a loss function (in our case, RMSE — Root Mean Square Error) which in essence, measure the difference between the predicted and actual observed values.



Note: the initial weights at the input layer take random values to begin with and are updated using the observed data. As such, there is an element of randomness in the predictions produced by a neural network. Therefore, the network is normally "trained" several times using different random starting weights, and the results are averaged.



# Universe analysis (8,000+ Issuers) Energy, Materials, and Utilities in Practice

### **Consider this:**

 Energy, Materials, and Utilities issuers, in aggregate, have reduced carbon emissions by 35%+ on average over the last 5 years relative to other sectors



 Energy, Materials, and Utilities issuers have also seen the largest improvement in factors associated with higher levels of adaptability (i.e. lower lock-in) relative to any other sector over the last 5 years



Source: Columbia Threadneedle Investments, as at April 2021.



# Regulatory/Outputs

- Total Carbon Emissions [ this analysis ]
- Weighted Average Carbon Intensity
- Carbon Footprint
- Carbon Intensity
- Exposure to Carbon Related Assets





# Regulatory/Outputs PRA Example

As noted in points 3.20 and 3.21 to the right, we can see that "The PRA expects firms to engage with wider initiatives on climate-related financial disclosures and to take into account the benefits of disclosures that are comparable across firms... the 'Taskforce on Climate-related Financial Disclosures'... The PRA expects firms to consider engaging with the TCFD framework and other initiatives in developing their approach..."

Supervisory Statement | SS3/19 Enhancing banks' and insurers' approaches to managing the financial risks from climate change

April 2019



3.20 The PRA expects firms to develop and maintain an appropriate approach to disclosure, reflective of the distinctive elements of the financial risks from climate change. Firms should look to evolve their disclosures to make these as insightful as possible, and in particular should ensure they reflect the firms' evolving understanding of the financial risks from climate change. Firms should recognise the increasing possibility that disclosure will be mandated in more jurisdictions, and prepare accordingly.

SS31/15 The Internal Capital Adequacy Assessment Process (ICAAP) and the Supervisory Review and Evaluation Process (SREP)', April 2018: https://www.bankofengland.co.uk/prudential-regulation/publication/2013/the-internal-capitaladequacy-assessment-process-and-supervisory-review-as.

Enhancing banks' and insurers' approaches to managing the financial risks from climate change April 2019 8

3.21 The PRA expects firms to engage with wider initiatives on climate-related financial disclosures and to take into account the benefits of disclosures that are comparable across firms. Various initiatives have done work on this area. For example, the 'Taskforce on Climate-related Financial Disclosures' published recommendations in June 2017,<sup>16</sup> and other initiatives have since then provided tools or case studies for organisations making climate-related financial disclosures. The PRA expects firms to consider engaging with the TCEP framework and other initiatives in developing their approach to climate-related financial disclosures.

3.22 In addition, firms would benefit from greater disclosure in the wider economy, and they would be in a strong position to encourage it through their ownership of financial assets.



# Regulatory/Outputs Article 173 Example

- As noted in points A and B in the Article 173 policy brief:
  - Measuring the carbon footprint of the investment portfolio
  - Analyzing the exposure to transition risks...
  - Measuring the contribution to climate change mitigation (i.e. alignment with 2\* pathway)
  - Article 173 employs a comply or explain approach allowing flexibility in outputs/analysis
  - "At the European level, EU guidelines must be at least as ambitious as article 173 and should take up the TCFD recommendations"

#### A. Summary of obligations u and general observations

The decree implementing article investors report on three dimension

- Measuring the carbon foot portfolio: this indicator calcu emissions generated by investm
- Analysing their exposure to physical risks: these are the linked to the transition to low-ca linked to physical impacts (extre rise, etc.);
- Measuring their contribut mitigation: this means measurin 2 degree pathway and calculatin the transition) and brown share ( portfolios.
- This obligation has resulted in the to measure these three dimensionare different possible methodologi development stage.

Although reporting is compulsory built around a comply or explain any financial actor that is unable obligations must explain their rea certain information.

#### BOX 2. THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Three years after the introduction of article 173-VI, the context has changed: investor climate reporting now has a strong international dynamic thanks to the work of the Task Force on Climate-related Financial Disclosures\* (TCFD) and could be introduced into the guidelines for the European directive\*\* on non-financial reporting.

The TCFD, chaired by Michael Bloomberg and mandated by the FSB, submitted its research in 2017. It recommends that financial and non-financial actors report on financial elements linked to the climate around four different areas: their governance, their strategy, their management of climate risks, and the indicators and objectives used. It also recommends that companies adopt a prospective approach, establishing strategies that are aligned with lowcarbon scenarios.

"TCFD, "Final Report - Recommendations of the Task Force on Climate-Related Financial Disclosures."

\*\* European Commission action plan on financing sustainable growth.

#### B. At the European level, EU guidelines must be at least as ambitious as article 173 and should take up the TCFD recommendations

Further to work by the Expert Group on Sustainable Finance<sup>4</sup>, the Commission made a proposal in its action plan<sup>5</sup> for the revision of the directive on non-financial reporting. With its status as a pioneer, France can drive an ambitious position that is informed by its national experience: a European reporting process that is at least as ambitious as article 173-VI. In view of current debates, it is important that this European reporting process includes a measurement of the contribution of portfolios to the objectives of the transition, in order to produce prospective indicators.

The directive on non-financial reporting includes **European guidelines**, which could be modified in line with the recommendations made at the French level.

To do so, it could draw on the **TCFD** recommendations, which advocate, for example, the analysis of different scenarios and the inclusion of information on climate risk strategy and governance.



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