VPIC CLIMATE CHANGE ANALYSIS

January 30, 2023

VPIC recognizes the *significance* of **global climate change** as a *critical issue* and has *acted* to mitigate risk

GLOBAL GOAL

The Intergovernmental Panel on Climate Change (IPCC) states to **avoid catastrophic impacts** of climate change, "global net human-caused emissions of carbon dioxide (CO_2) would need to **fall by about 45 percent** from 2010 levels **by 2030**, reaching **'net zero' around 2050**." [1]

ROLE OF NET ZERO

What does 'net zero' mean?

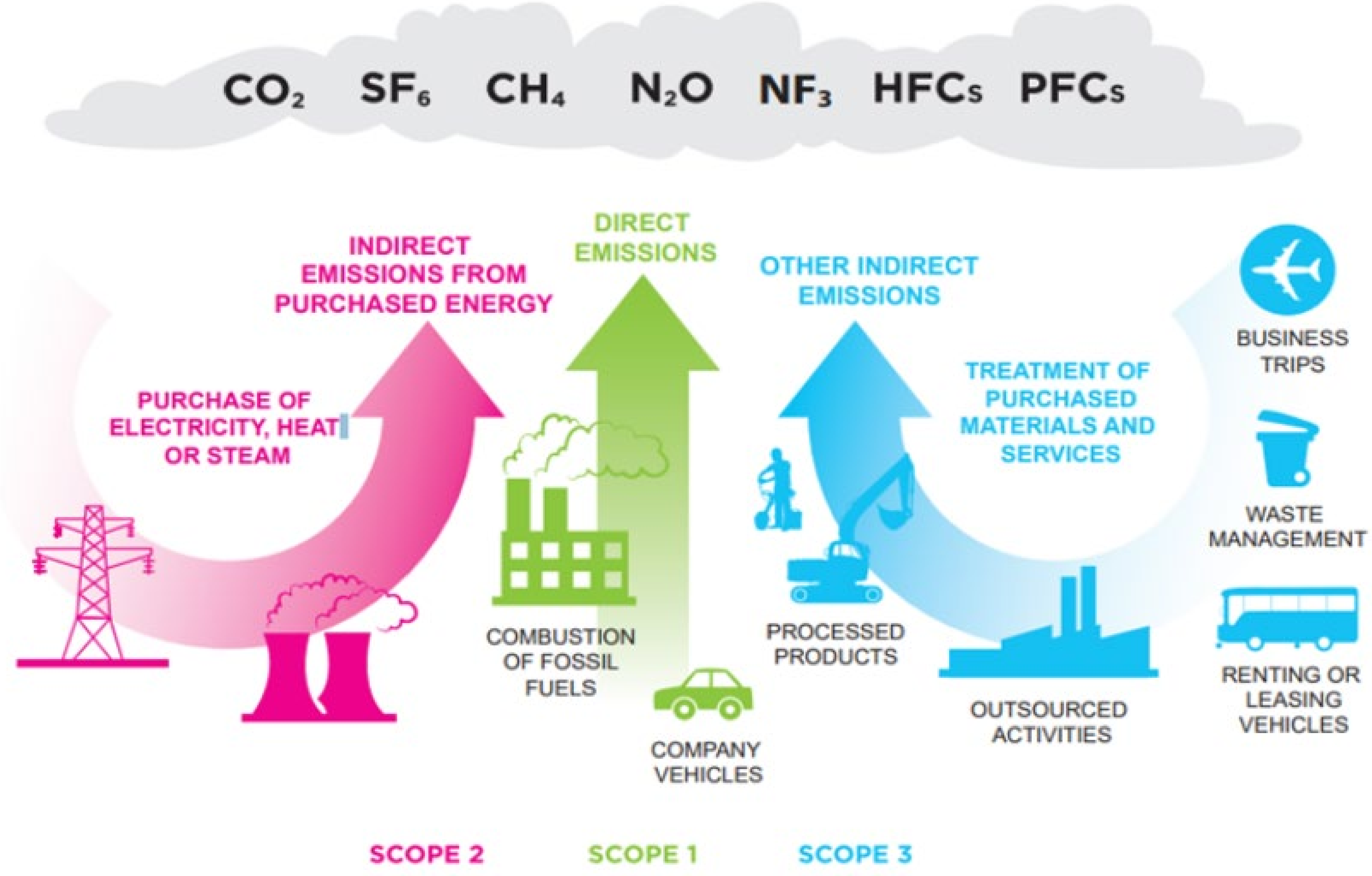
Net zero requires emissions be cut to zero as close as possible, with remaining re-absorbed into the atmosphere by **offsets**.[1]

For **companies**, net zero pledges **must include** "direct emissions [**Scope 1**], emissions produced by the power they use [**Scope 2**], and everything in their value chain [**Scope 3**]."[2]

Reliable measurement is required to meet this quantifiable goal to offset company emissions and ensure they net to zero.

1 United Nations: Climate Action. "For a Livable Climate: Net-Zero Commitments Must be Backed by Credible Action"
2 Columbia Climate School. State of the Planet. "Net Zero Pledges: Can They Get Us Where We Need To Go?". December 16, 2021. Renee Cho

Net Zero Pledges Hold Companies Accountable



Source: *[“What is the Difference Between Scope 1, 2, and 3 emissions?”, Tim Greenhalgh, February 25, 2020]*

THE PARIS AGREEMENT

The Paris Agreement is a **legally binding** international treaty on climate change that went into effect on November 4, 2016. It strives to achieve the global goal.

Achievements to date?

- National policies to **invest in new infrastructure** and technology to address climate change, such as that found in the US Inflation Reduction Act.[1]
- "By 2030, zero-carbon solutions could be competitive in sectors representing **over 70% of global emissions**." [2]

[1] *The White House. "New OMB Analysis: The Inflation Reduction Act Will Significantly Cut the Social Costs of Climate Change. August, 23, 2022*
[2] *"The Paris Agreement.", United Nations Framework Convention on Climate Change*

Why Not Divest?

EXPENSIVE

Divestment would result in increased costs associated with transaction and management fees, as well as performance losses from the inability to allocate to top-tier private market investment strategies.

Divesting Reduces the VPIC's Expected Return

-0.50% decrease in the VPIC's long-term expected return equates to a required contribution shortfall of **$55 million annually.**

Through 2038 an additional **$750 million in contributions** would be needed.[1]

Portfolio Risk/Return Expectations [2]	Current VPIC Target Allocation	VPIC Divested Allocation	
Long-Term Expected Return	5.6%	5.1%	→ Return decreases -0.5%
Standard Deviation (Risk)	10.8%	11.5%	→ Risk increases +0.7%

[1] Segal. Matthew Strom. February 3, 2023

[1] Projection assumes a 5% annual growth rate of the portfolio balance from December 31, 2022 until 2038. Private Market divested exposure includes EMD

Actuarial Projections

Teachers

2022 Valuation ($ in millions)		Baseline	6.50% Investment Return Assumption
Actuarial Accrued Liability:		$4,289.8	$4,548.3
	Change from Valuation Assumptions:		$258.5
Funded Percentage on AVA Basis:		57.3%	54.0%
	Change from Valuation Assumptions:		-3.3%
Total Normal Cost*:		$79.7	$90.7
	Change from Valuation Assumptions:		$11.0
Actuarially Determined Contribution for Fiscal 2024:		$194.3	$223.5
	Change from Valuation Assumptions:		$29.2

*Total normal cost as of July 1, 2022, adjusted for timing.

State Employees

2022 Valuation ($ in millions)		Baseline	6.50% Investment Return Assumption
Actuarial Accrued Liability:		$3,444.1	$3,653.7
	Change from Valuation Assumptions:		$209.6
Funded Percentage on AVA Basis:		69.9%	65.8%
	Change from Valuation Assumptions:		-4.1%
Total Normal Cost*:		$74.1	$83.1
	Change from Valuation Assumptions:		$9.0
Actuarially Determined Contribution for Fiscal 2024:		$121.9	$147.1
	Change from Valuation Assumptions:		$25.2

*Total normal cost as of July 1, 2022, adjusted for timing.

Source: Segal. Matthew Strom. February 3, 2023

Highlighted box added by Staff to highlight the projected losses in the analysis

Divesting Would Have Incurred Performance Losses Historically

Performance	3-Year Annual Return	5-Year Annual Return
VPIC Divested Portfolio Estimate	2.70%	4.01%
VPIC Actual Portfolio	4.45%	5.23%
Difference	-1.75%	-1.22%
Profit/Loss	-$83,496,233	-$52,925,875
VPIC Private Equity	*26.71%*	*25.07%*
VPIC Private Credit	*8.67%*	*7.59%*

As of 12/31/2022

Divesting Increases VPIC's Management Fee

	Fee ($)	Fee (%)
VPIC Indexed Allocation	$818,338	0.028%
VPIC Divested Indexed Allocation	$1,514,998	0.052%
Difference	**+$696,660**	**+0.024%**

Methodology:* *VPIC Divested Indexed Allocation follows the pricing schedule of the VPIC Low Carbon Transition Readiness Index Fund as a proxy. ***NEPC notes on page 13 of their "MainePERS: Divestment Report", that reviewed the impact of divestment of fossil fuels for Maine PERS' portfolio, "management fees for customized strategies avoiding fossil fuel investments are likely to be 1-3 basis points higher."*** ***This equates to a near doubling in fees, as seen above.***

INEFFECTIVE

Numerous studies have found that divestment campaigns produce no discernable impact on share prices or company valuations.

Scholars: Divestment is Ineffective Compared to Engagement

"…Voluntary corporate divestment from South Africa had little discernible effect either on the valuation of banks and corporations with South African operations or on the South African financial markets."[3]

"We conclude that divestment campaigns, considered on their own, have not been especially effective as a means of significantly reducing CO_2 emissions, and they are not likely to become more effective over time."[1]

"Divestment is perhaps the final, and most drastic, instrument in an investor's corporate engagement toolkit. Considerable communication with management of the target firm can be undertaken to influence behaviour before using up the trump card of divestment."[2]

"The direct impacts of fossil fuel divestment on equity or debt are likely to be limited…. Divested holdings are likely to find their way quickly to neutral investors. Some investors may even welcome the opportunity to increase their holding of fossil fuel companies, particularly if the stocks entail a short-term discount."[2]

[1] Hansen, Tyler and Pollin, Robert. "Economics and Climate Justice Activism: Assessing the Fossil Fuel Divestment Movement." Review of Social Economy, vol. 80(1), 2018. Available at https://peri.umass.edu/publication/item/1076-economics-and-climate-justice-activism-assessing-the-fossil-fuel-divestment-movement

[2] Ansar, Atif, Caldecott, Ben and Tilbury, James. "Stranded Assets and the Fossil Fuel Divestment Campaign: What does Divestment mean for the Valuation of Fossil Fuel Assets?" Stranded Asset Programme, University of Oxford, 2013. Accessible at https://ora.ox.ac.uk/objects/uuid:f04181bc-8c4f-4cc1-8f01-cafce57975ae/files/mc1a682ca2c4dd021068f54ac1dd0537e

[3] Teoh, Siew H., Welch, Ivo, and C. Paul Wazzan. "The Effect of Socially Activist Investment Policies on the Financial Markets: Evidence from the South African Boycott." *Journal of Business*, vol. 72, no. 1, 1999. Pp. 35-89. Accessible at https://www.jstor.org/stable/10.1086/209602#metadata_info_tab_contents

[4] Patey, Luke. "Against the Asian tide: the Sudan divestment campaign." *The Journal of Modem African Studies*, vol. 47, no. 4, 2009, pp. 551-573. Accessible at www.cambridge.org/core/journals/journal-of-modern-african-studies/article/div-classtitleagainst-the-asian-tide-the-sudan-divestment-campaigna-hreffn01a-ref-typefnadiv/DBB0FD441DB1F53D20CB366D14C640A9

[5] Hong, Harrison, and Kacperczyk, Marcin. "The price of sin: The effects of social norms on markets." Journal of Financial Economics, vol. 93, 2009, pp. 15-36. Accessible at http://pages.stern.nyu.edu/~sternfin/mkacperc/public_html/sin.pdf

Studies Finding Divestment Ineffective

- **Grinnell College** created a special task force to study whether divestment from fossil fuels would be a prudent and impactful strategy for the college endowment. They found that divestment would introduce significant investment risk in the endowment while having little, if any, direct impact on climate change. The task force recommended the College "not divest from fossil fuel holdings." and instead "take actions to enhance existing ESG capabilities as well as the degree of shareholder engagement…"[1]

- Three professors at **Harvard University, University of Chicago, and Universita di Trento** conducted a study of divestment and engagement, and found "that in a competitive world exit [divestment] is less effective than voice [engagement] in pushing firms to act in a socially responsible manner."[2] They noted that "there is no guarantee that divestment will achieve a desired social goal, while consistent badgering can."[3]

[1] "Task Force on Fossil Fuel Divestment and Climate Impact, Report of the Grinnell College Board of Trustees, April 28, 2018

[2] Eleonora Broccado, Oliver Hart, Luigi Zingales. "Exit vs. Voice". December 2020

[3] Patrick Temple-West. "The ESG Investor's Dilemma: to engage or divest?" January 26, 2021, Financial Times

ENGAGEMENT WORKS

Climate Action 100+ tracks investors' progress, including VPIC, engaging **167 focus companies** accounting for **80% of global industrial GHG emissions.**

- **75%** made **net-zero commitments** reducing 2050 emissions by over a quarter of global GHG emissions today.
- **92%** have **board-level oversight** of climate change risks
- **91% reported financials aligned to TCFD**, which provides guidance to companies for transparent climate-related reporting

Source: "Climate Action 100+: 2021 Year in Review A Progress Update", December 2022

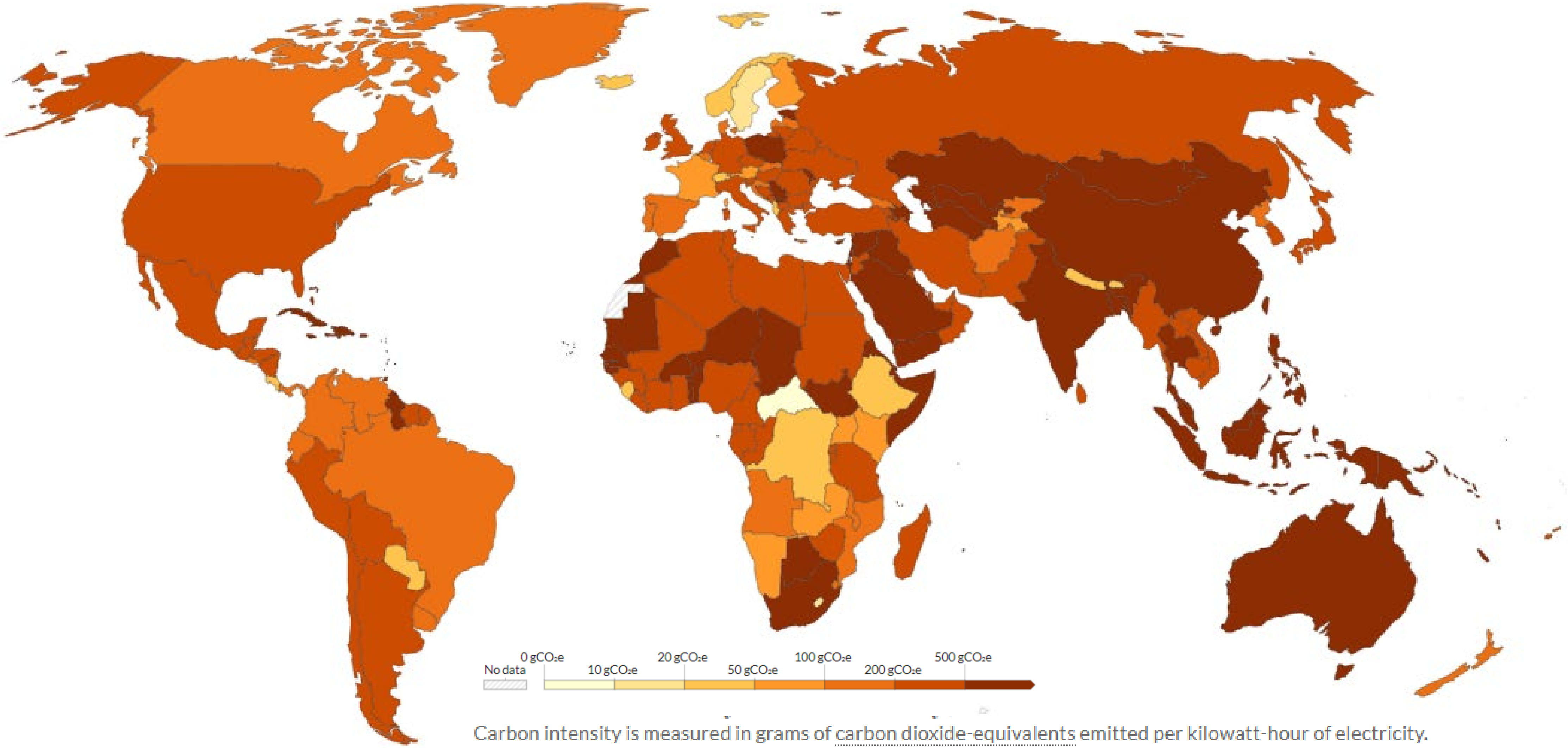
Next Steps & Conclusions

- VPIC will take action to advance the global goal to reduce emissions by 45% from 2010 levels by 2030, and reach ‘net zero’ by 2050.
- Divestment is not consistent with VPIC’s fiduciary duty
- The Commission will report progress annually toward its above pledge to reduce carbon and strive toward the global goal
- VPIC will continue to hold public companies accountable directly and through partnerships to reduce carbon emissions globally and meet their net-zero goals with its shares of fossil fuel companies [0.7% VPIC portfolio, $40mm].


Where are we Today

The World is Dependent on Reliable Electricity

Carbon Intensity of Electricity, 2021



Carbon intensity is measured in grams of carbon dioxide-equivalents emitted per kilowatt-hour of electricity.

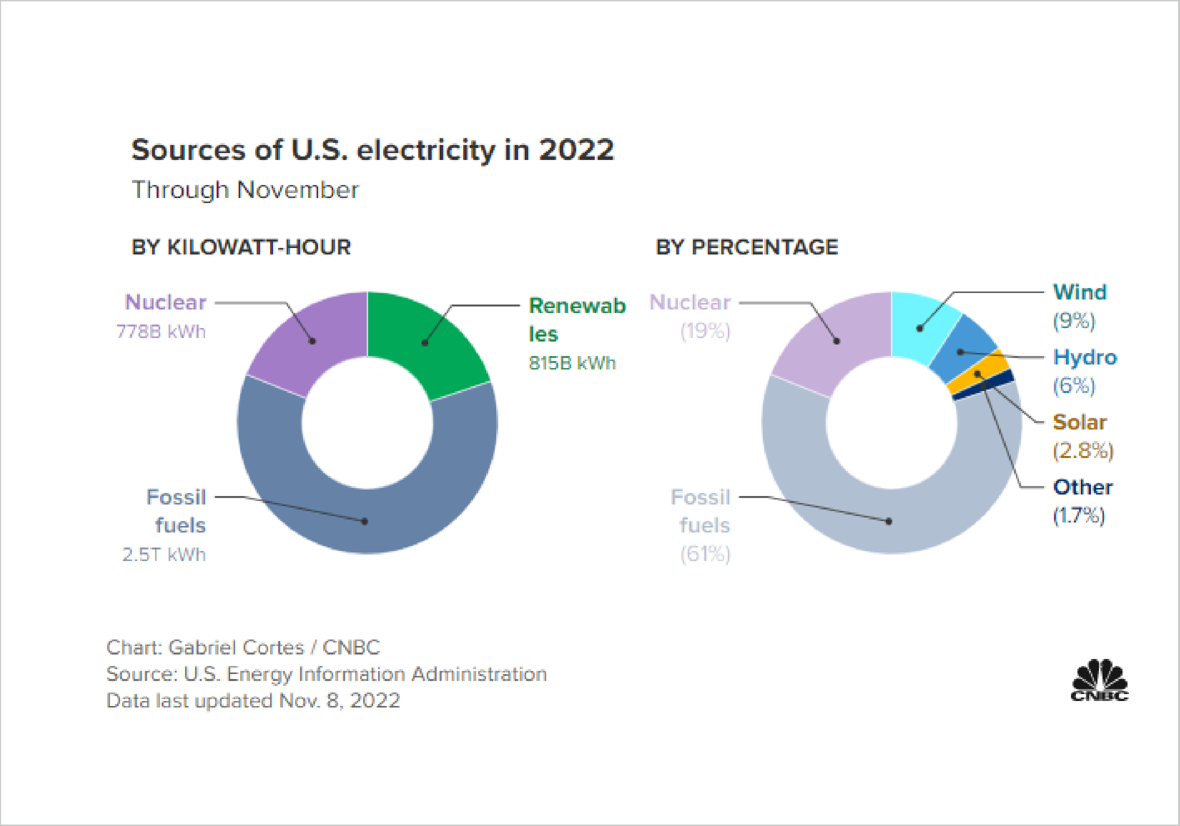
Source: [Ember Climate](#) [(from various sources including the European Environment Agency and EIA aggregated at our World in Data)](#)

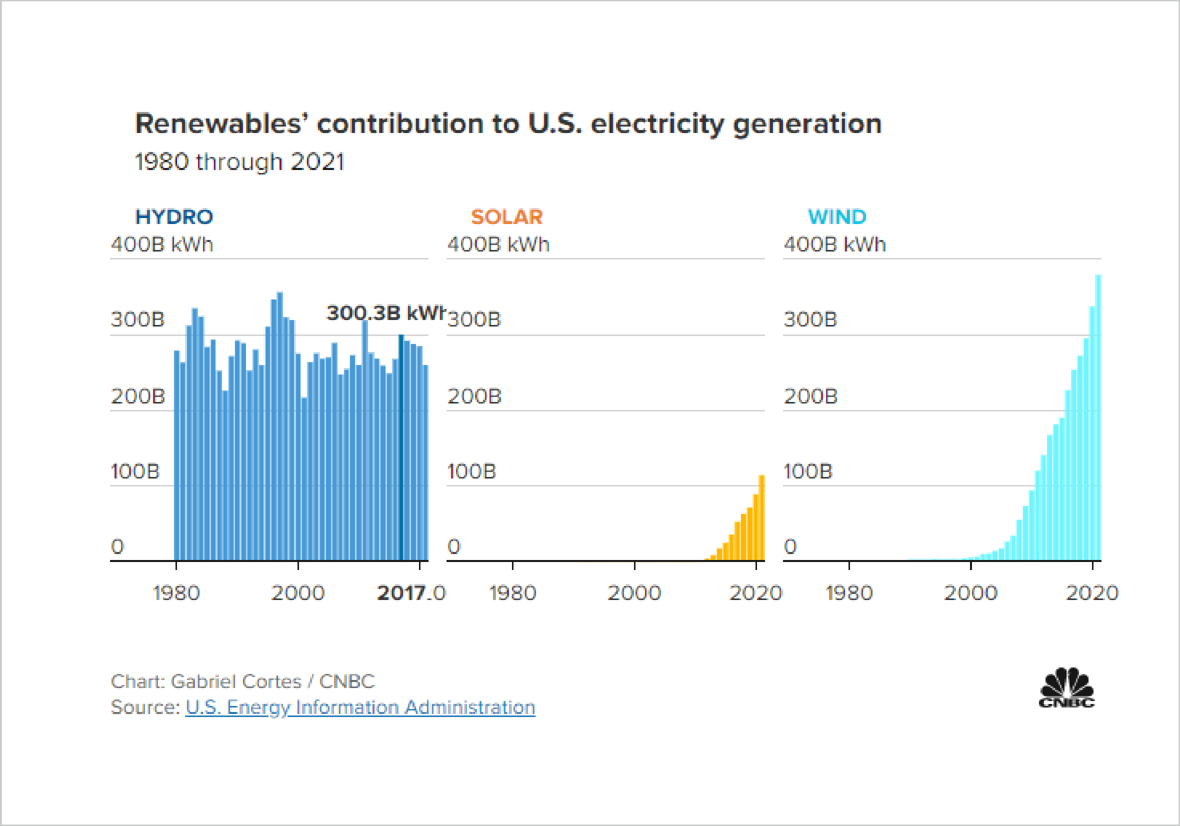
In 2022, Fossil Fuels accounted for 61% of electricity

Renewable power faces challenges due to Intermittency, Storage Limitations, and Technical Losses, such that a Green Power grid would require significantly more generation capacity today to replace the same level of demand of the current grid.

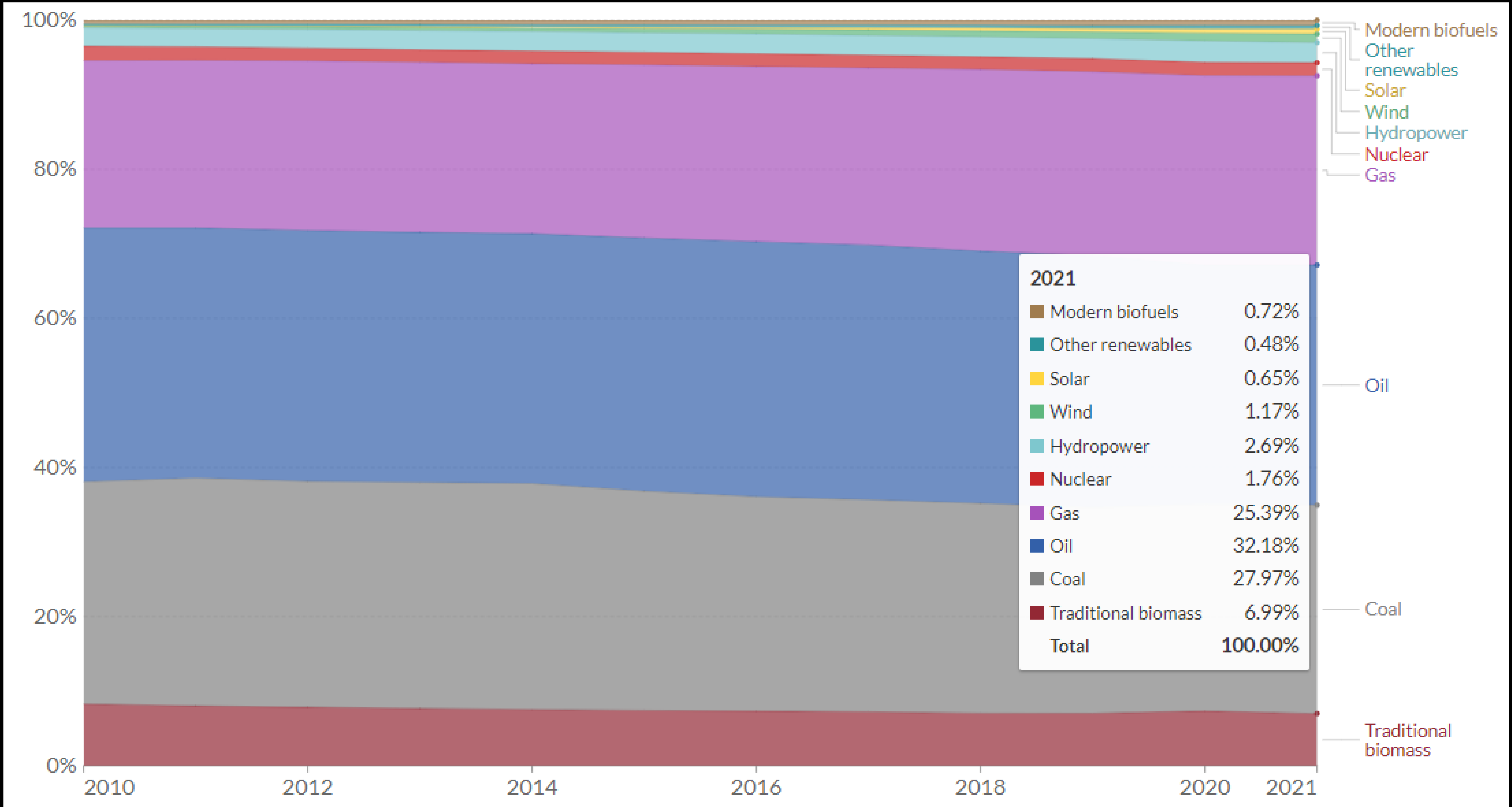
Renewables are seeing significant acceleration

Recently they are more cost-competitive. Additional investment in infrastructure and technological advancements are needed to address the reliability issues.





Global Direct Primary Energy Consumption



Source: [Our World in Data based on Vaclav Smil (2017) and BP Statistical Review of World Energy]

Where We Need To Go

Source: South America's Lithium Triangle

The World needs *significant* capital expenditure to achieve the global goal

Companies **need capital** from institutions like VPIC to reach their net-zero targets

To **provide capital** VPIC and other investors must have companies transitioning in the portfolio

Investors hold portfolio companies accountable through engagement and monitoring. Including requests for:

Climate-related Disclosure	Interim Carbon Reduction Targets	Board-level Oversight and Environmental Expertise

Over 20% of the world's 2,000 largest public companies have committed to net-zero emissions [1]

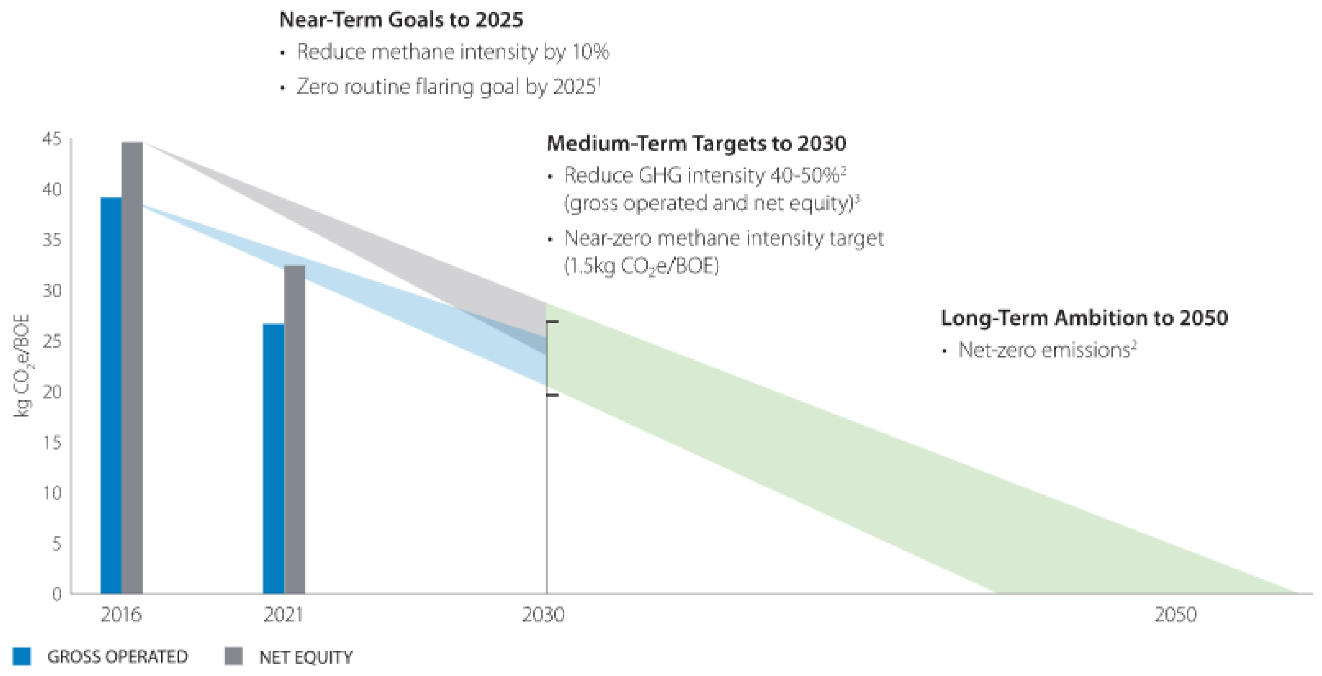
Apple	Apple commit to carbon neutrality by 2030
gm	Transitioning to an all-electric fleet by 2035, net zero emissions by 2040
CEMEX	Mexican-based cement company committed to delivering net zero CO_2 concrete by 2050
Ford	Net zero emissions by 2050 by investing $11.5 billion to electrify its nameplate vehicles
amazon	Investing $12B to develop climate-focused technology to help themselves & others achieve net zero
bp	Cutting oil and gas production by 40% over the next decade to help meet its net zero emissions goals by 2050
ExxonMobil	Ambition for net zero GHG emissions by 2050[2]

[1] *Segal Marco Advisors*

[2] *ExxonMobil Press Release, January 18, 2022*

Many companies plan to transition to net zero emissions using quantifiable interim targets

ConocoPhillips: Goals for Net-Zero Ambition[1]



[1] In line with the World Bank Zero Routine Flaring initiative.
[2] Scope 1 and 2 emissions on a net equity and gross operated basis.
[3] 2030 target relative to a 2016 baseline.

***Note: GHG emissions intensity measure is stated as both "gross operated" covering assets operated by the company, and "net equity" for those where the company has an equity ownership.[2]*

The interim steps are achieved through a variety of solutions:

- **invest** in low carbon technology
- **retire** inefficient infrastructure
- **acquire** sustainable energy sources

These actions by the company **diversify** operations and boost efficiency to increase shareholder **value** and **divest** stranded assets.

1 ConocoPhillips, ICCR. Sustainable Development: Plan for the Net-Zero Energy Transition. April 2022, Julie Dalzell.
2 ConocoPhillips. "Emissions Reduction Target Principles"

VPIC GOVERNANCE

The issue of climate change demands a ***multidimensional*** approach by investors to prudently address the ***complex*** risks and opportunities that present across **all market sectors and geographies** within the portfolio. VPIC has adopted a Carbon Reduction & Mitigation Policy to govern its efforts to ***advance*** the transition to a global low carbon economy.

VPIC ENGAGEMENT

- Carbon Disclosure & Mitigation Policy
- Environmental, Social & Governance policy
- VPIC Sustainable Investment Report