

# AFP<sup>®</sup> Annual Conference



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ORIGINAL  
ESSENTIAL  
UNBIASED  
INFORMATION



## Practical Aspects of Managing Carbon Assets & Liabilities

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# Are We Prepared?

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- What percentage of US companies may be impacted by climate change regulation / legislation?

**100%**

Either directly or via their supply  
chain – Kiplinger Letter

- What percentage of companies integrate (or plan to) climate-change strategies into their business model?

**16%**

Treasury & Risk  
Survey

# Topics

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- I. Environmental Markets – The Basics
- II. Measuring & Reporting Emissions Liability
- III. Hedging & Acquisition of Allowance / Offset Assets
- IV. Summary
- V. Appendix - Additional Information

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# THE BASICS

# Six types of Regulated Greenhouse Gases (GHG)

- Each GHG has a different impact on global warming and it's regulated emissions
- A gas' impact is defined as its Global Warming Potential (GWP)
  - GWP is measured as compared to the impact of CO<sub>2</sub>, which has a GWP of one

**List of Greenhouse Gases**

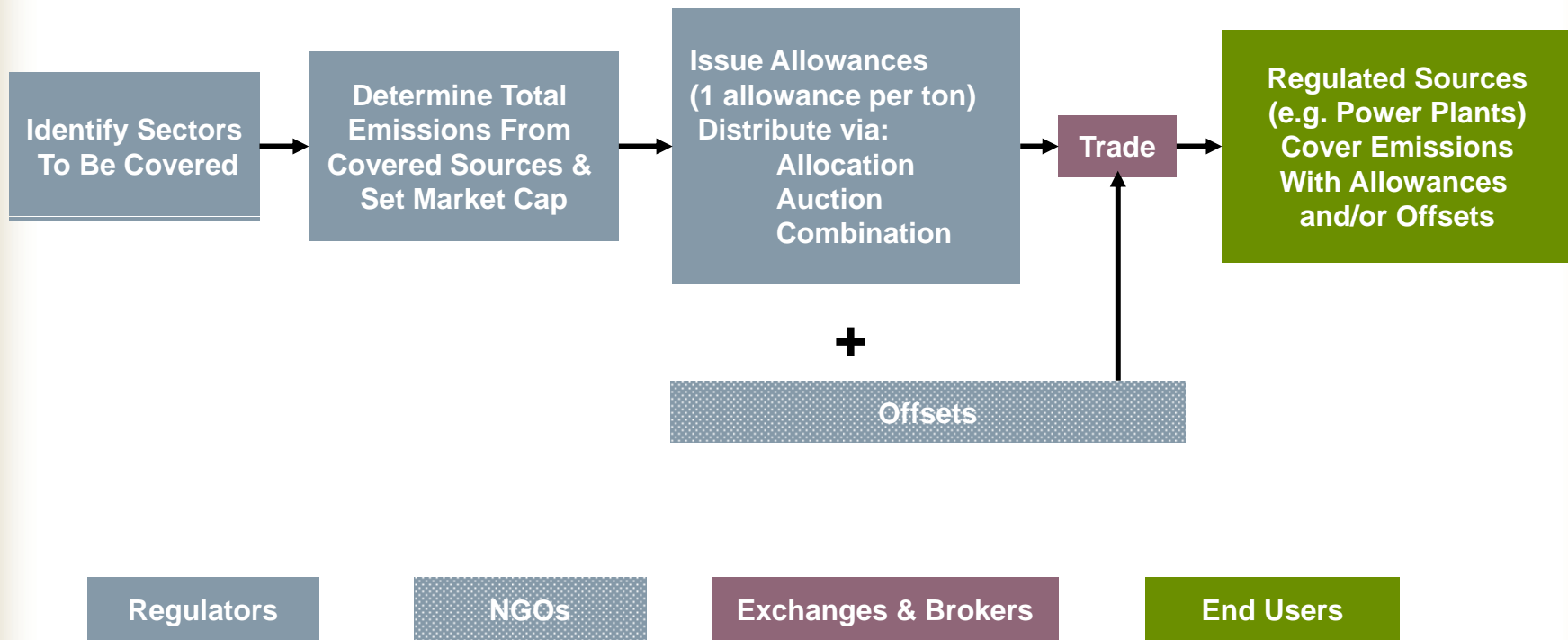
Chemical Symbol	Name	Produced From	GWP *
CO <sub>2</sub>	Carbon Dioxide	fossil fuel combustion	1
CH <sub>4</sub>	Methane	coal mining, landfill gas, biomass, waste water	25
N <sub>2</sub> O	Nitrous Oxide	aerosol propellant, adipic acid plants (used to make polyester)	298
ODS	Ozone Depleting Substances	refrigerants / fire suppression agents	1,000 - 10,000
PFC	Perfluorocarbons	dry cleaning, polyester production	7,390 - 12,200
SF <sub>6</sub>	Sulphur Hexafluoride	cover gas in electrical switchgear equipment	22,800

File: K: FPLE Portfolio \ Renewable \ Carbon \ FPLE-GHGS \ List of GHGs

\* Global Warming Potential relative to CO<sub>2</sub>

# Environmental Markets

## The Basics



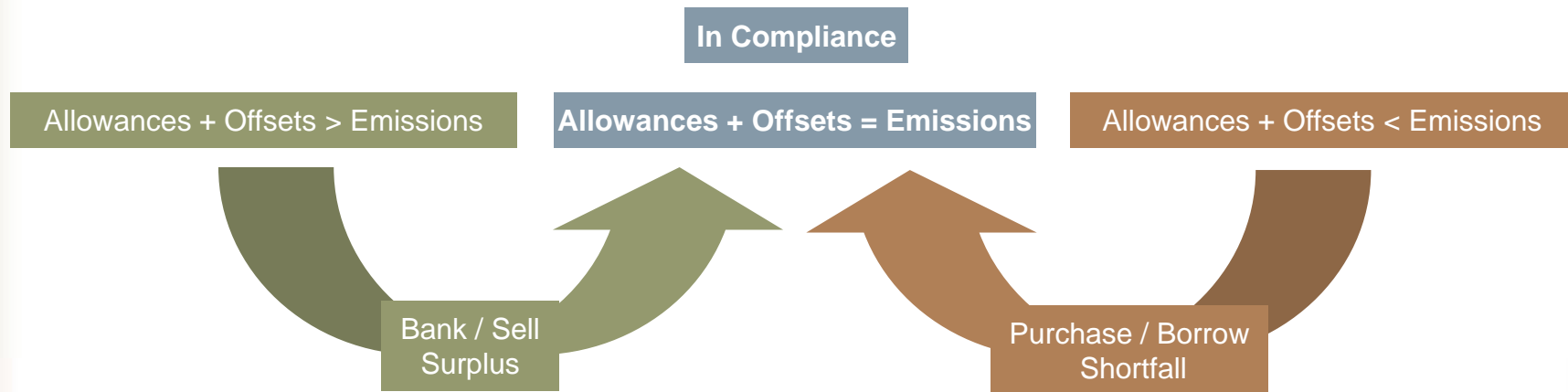
# Offset Project Types



Renewable Energy	Energy Efficiency	HFC & N <sub>2</sub> O	Waste	Afforestation & Reforestation
Hydropower project producing electricity replacing coal fired power in China	Replacing inefficient light bulbs with efficient ones in Polish government buildings, using less fossil-based electricity	Installing equipment decomposing byproduct from refrigeration processes	Installing equipment capturing methane generated at a landfill and using it to produce electricity	Avoiding deforestation of rainforest and hence maintaining its ability to store carbon, Brazil.

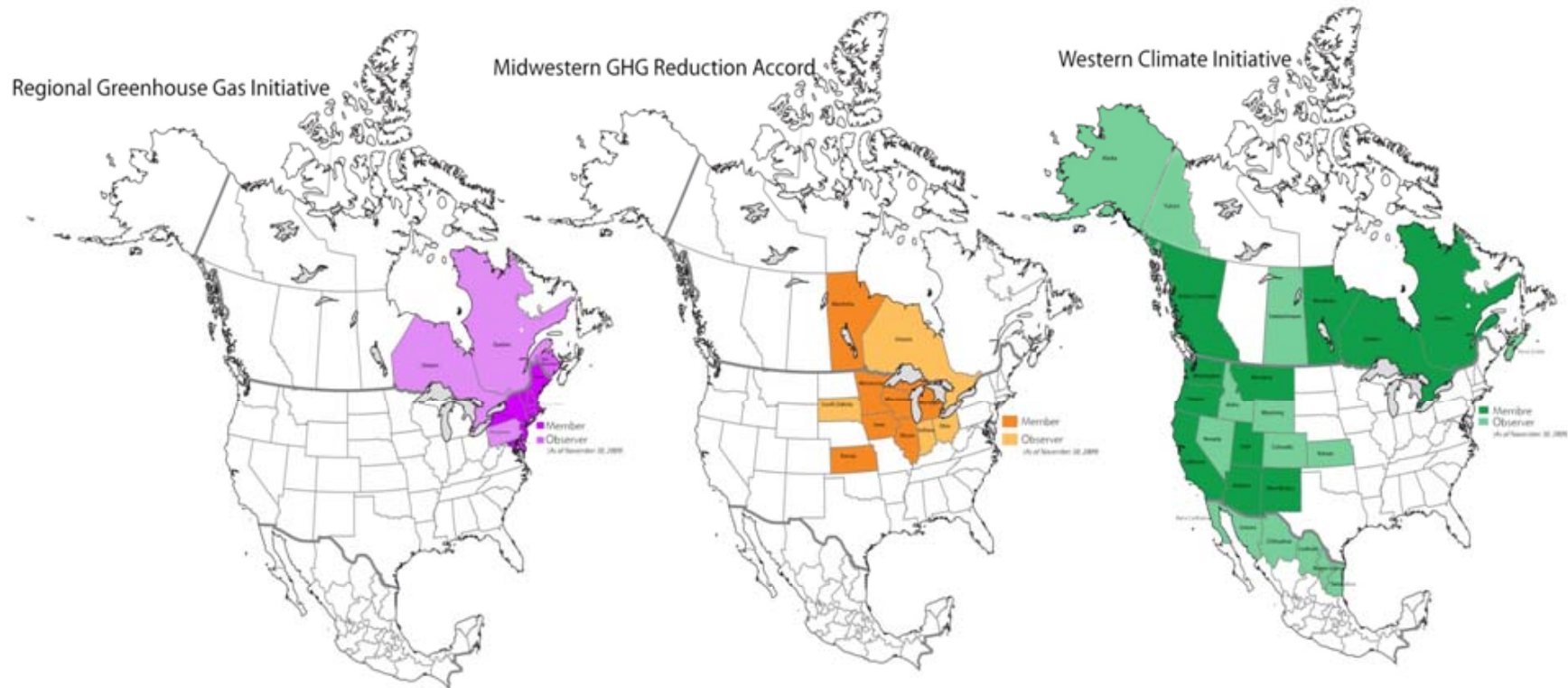
# The Role of Carbon Trading

- Emitters will choose least cost option:
  - Internal abatement (reduce emissions)  
(scale back output, relocate, alter mode of operation, fuel switching, new technology/investments)
  - Buy surplus emission allowances
  - Invest in verified GHG reduction projects = buy offsets
  - Pay penalty for non-compliance
- Carbon trading unleashes the creativity & economic incentives of markets in allocating capital to the least cost emission reduction options.





# Regional North American Programs



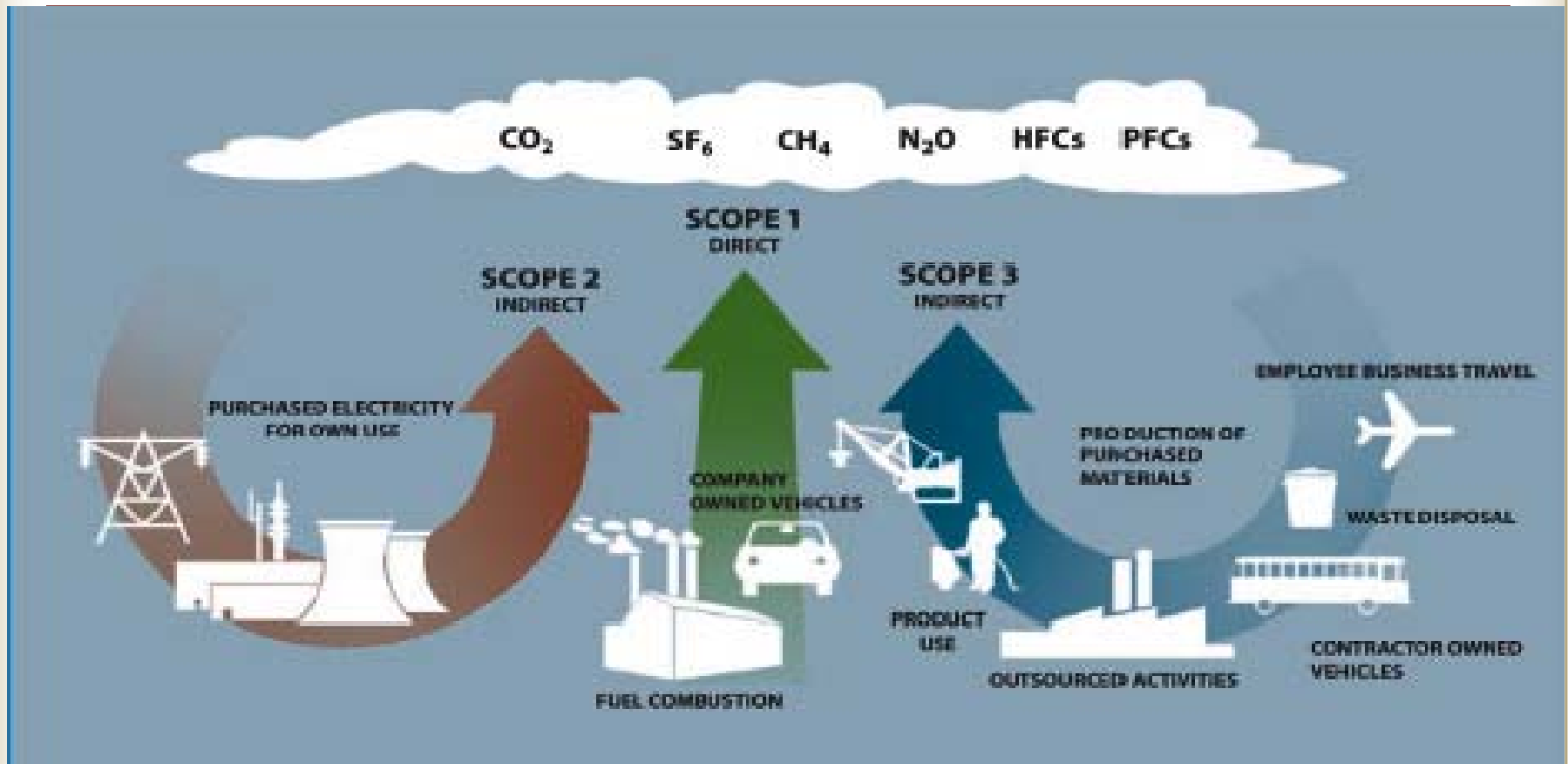
Source: KPMG

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# MEASURING & REPORTING

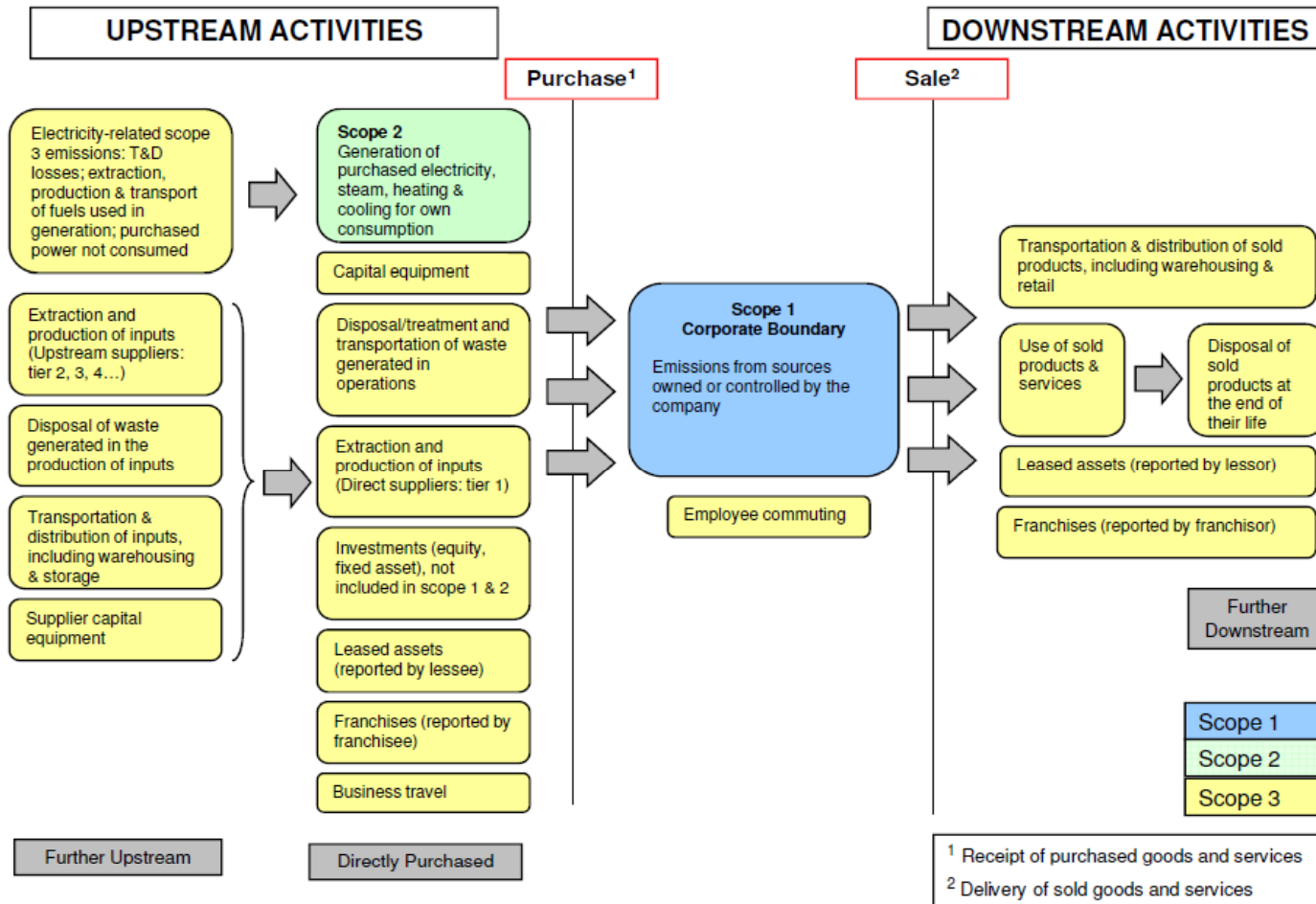
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# GHG Protocol & Scopes



Source: GHG Protocol Corporate Accounting and Reporting Standard

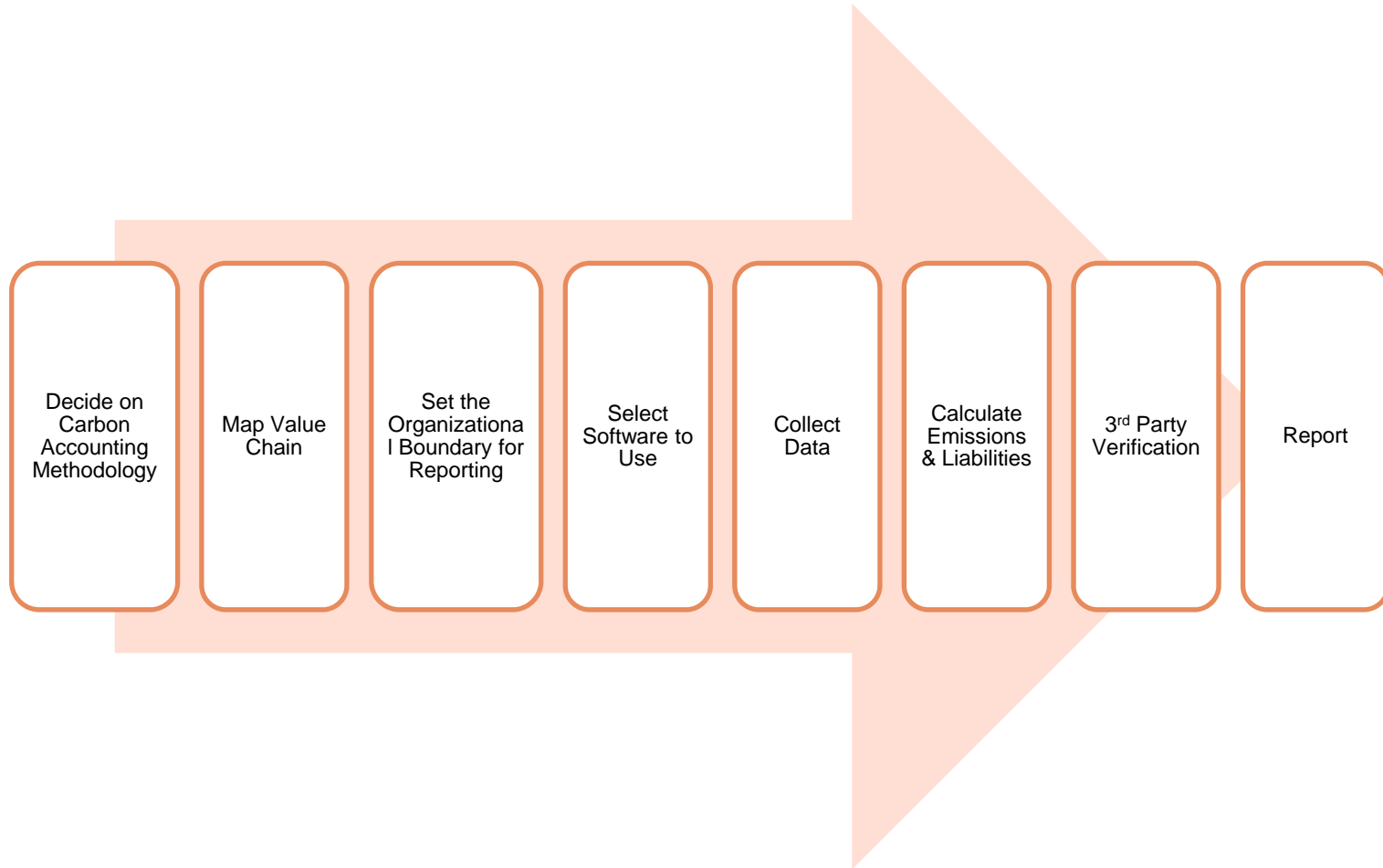
# GHG & Your Value Chain



Source : GHG Protocol Initiative World Resources Institute

# Steps in Accounting & Reporting

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# Key GHG Reporting Standards

Jurisdiction	Guidance or Standard	Focus	GHGs Covered	Scope 1	Scope 2	Scope 3
International	GHG Protocol: <a href="#">Accounting and Reporting</a> Standard	Published 2004. Internationally recognized procedure for preparing verifiable emission reports. Supported by calculation tools.	All 6 Kyoto gases	Yes	Yes	Optional
International	<a href="#">ISO 14064-1, 2 &amp; 3</a> : GHG Accounting & Verification	Published 2006. Modeled on the GHG Protocol. Used to quantify, report and verify GHG emissions at organization and project level.	All 6 Kyoto gases	Yes	Yes	Optional
North America	The Climate Registry ( <a href="#">TCR</a> ): General Reporting Protocol	First published 2008. Guidelines and calculation tools for voluntary emissions reporting programs.	All 6 Kyoto gases plus optional gases	Yes	Yes	Optional
International	BSI <a href="#">PAS 2050</a> : Specification for the Assessment of Life Cycle GHG Emissions of Goods & Services	Published 2008. Detailed technical spec to be used with a guide that presents worked examples of the carbon footprint of goods and services.	All	Yes	Yes	Yes
US	GHG Reporting Rule, <a href="#">40 CFR Section 98</a>	Federal reporting program introduced by the EPA in 2010. Mandatory for all installations emitting >25,000 CO <sub>2</sub> e tonnes per annum. Includes mobile sources.	All 6 Kyoto gases plus additional fluorinated gases	Yes	-	-

# Software to Measure & Manage

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## Energy & Fuel Efficiency

- Monitor stationary and mobile asset operating performance for
  - Energy
  - Fuel
  - water
  - Travel
  - Freight
- Optimize supply chain for fuel, energy cost, miles and emissions

## Carbon Management

- Gain Carbon intelligence like CO<sub>2</sub> hotspots by facilities, assets, products, suppliers & customers
- Build carbon price into minds of employees
- Goal setting and reduction tracking

## Compliance & Accounting

- Manage exposure to carbon-related regulatory, brand & financial risk
- Carbon accounting for enterprise & suppliers
- US EPA & Climate Registry reporting

# Enterprise Carbon Dashboard





# Key Issues & Challenges

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- What do you include / exclude in your GHG inventory?
- How to collect data from multiple facilities?
- How to track asset level energy usage/emissions?
- How to ensure consistent data collection ?
- How do get reporting in the supply chain?
- How to account downstream emissions (e.g., product transport, disposal)?
- What level of accuracy is needed?
- How to calculate and scope 3 emissions?

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# HEDGING & ACQUISITION

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# Carbon Market Transaction

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- Carbon allowances offset credits are bought and sold in units of equivalent tons of CO<sub>2</sub> (tCO<sub>2</sub>e)
- Almost all carbon markets use metric tons as the unit of measure
  - 1 metric ton = 1,000 kg = 2,204 lbs
  - The Regional Greenhouse Gas (RGGI) market in the northeast U.S. trades in short tons (2,000 lbs)
- Approximately 90% of all *compliance market* transaction are Futures
  - only 10% spot trades
- Approximately 90% of *voluntary market* transactions are OTC or bilateral spot trades

# Acquiring Allowances

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- Zero cost allocation directly from Regulator
  - To non-emitters in order to reduce economic impact (a.k.a immunization)
  - To emitters to reduce cost of compliance
- Market auctions
  - Uniform price, sealed bid (single round) format is typical
  - Double auction also a common feature
    - Sellers of previously issued allowances may elect to add their allowances to new allowances being sold by the regulator
- Open market purchases
  - Spot & Futures

# Acquiring Offsets

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- Open market purchases
  - Spot
  - Futures
  - Bilateral
- In-direct participation in Offset projects
  - Long term ( typically 3 to 5 year) Emission Reduction Purchase Agreements (ERPAs) via agreement with Offset Project Developer (e.g. Landfill methane capture)
- Direct ownership of Offset projects
  - Many utilities now pursuing

# Why Invest In Carbon Offset Projects?

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There are economic and strategic reasons for entering the carbon offset market at an early stage

- Economic
  - Most carbon project developers do not have ready access to investment capital
  - Delay in legislative progress has dampened appetite for capital deployed in US based projects
  - Early stage participation in carbon projects may generate returns above other project opportunities
- Strategic
  - Investment diversification
  - Growth opportunity
  - Hedge against future compliance obligations

# Process to Create Carbon Offset Credits

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There is a defined process for projects to go through to create carbon offset credits

- Project developer chooses a Standard and the appropriate protocol within that Standard for the project type – e.g., VCS, Landfill Gas
  - Developer writes a project description document (PDD)
    - Follows the format prescribed by the protocol
    - Identifies and calculates the quantity of GHG reductions in tCO<sub>2</sub>e
    - Correctly answers other questions posed by the protocol
  - Developer hires an independent third party to “validate” the PDD – this is a “qualification” of the project
  - Developer hires an independent third party to “verify” the actual reduction in emissions
  - Standard entity issues offsets
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# Carbon Offset Project Risks

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While each specific carbon offset project has its own set of risks, some risks are shared across offset project types

- Merchant risk
    - There are no guaranteed buyers in the voluntary market
    - Price for offsets fluctuates with regulatory / protocol changes
  - Regulatory risk
    - Federal carbon legislation will determine offset project type eligibility for carbon allowance substitution
    - If a GHG is required to be controlled / destroyed (regulated), then a project undertaken to abate the GHG does not produce eligible offsets since it is “business as usual”
  - Quantity risk
    - The project may produce fewer offsets than projected
    - This has been a problem for many Kyoto offset projects
  - Protocol risk
    - Protocols governing a offset project type may not be approved
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# SUMMARY

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# Steps to understanding your position

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*As suggested by Evolution Markets:*

- Develop internal GHG reporting processes, controls, identify personnel
- Quantify emissions using the GHG Reporting Tool
- Inventory internal facility measures available to achieve reductions/estimate internal reduction potential and costs – energy efficiency, fuel switching/consumption reduction, retrofits, process changes, etc.
- Assess most cost effective pathway to compliance
- Project medium to long term emissions growth considering fuel consumption patterns, economic growth, and other variables driving emissions at facility
- Monitor regulatory developments affecting position, specifically:
  - Allowance allocation strategy - % free vs. % auction ? ARB expects to auction a greater amount than WCI minimum requirements
  - Cap setting – it will be linear and declining but how tight ?
  - Offsets system – types, vintage, location, caps, etc. (extremely dynamic)

# Developing A Market Strategy

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*As suggested by Evolution Markets:*

- Define your risk appetite and budget capital expenditures
- Develop market intelligence – current pricing, deal structures, market trends, risks and menu of trade options
- Tailor a market strategy consistent with risk appetite and capital expenditures, considering market conditions
- Assess risk-reward of putting on early action offsets position, taking into consideration different regulatory scenarios
- Execute

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# QUESTIONS

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# APPENDIX

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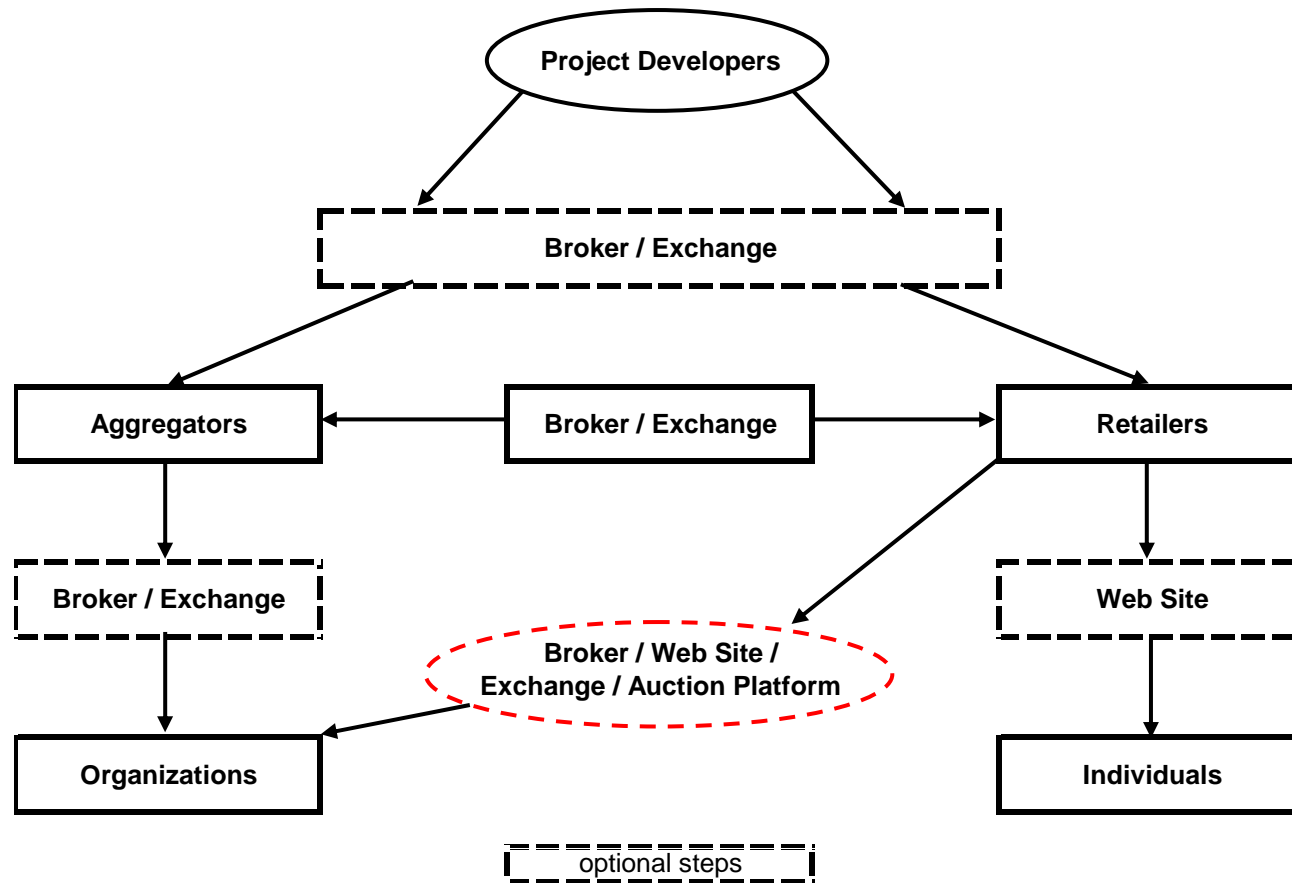
# More About Allowances & Offsets

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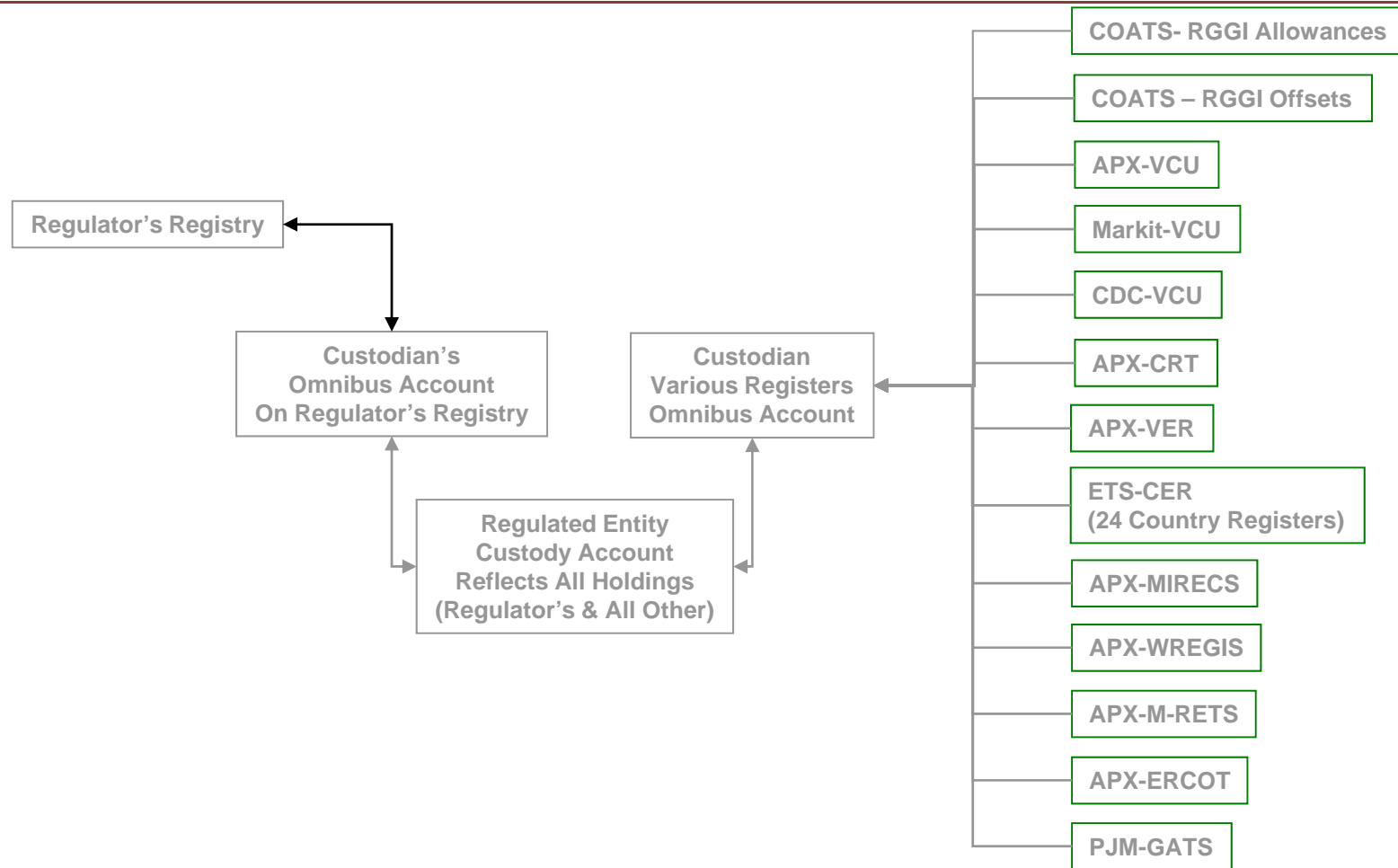
- Allowances
  - Regulating entity (e.g. EPA) issues allowances. Regulator determines:
    - The number of allowances they will issue and
    - The number of offsets permitted per annum
      - Total allowances issued and Offsets permitted decreases over time to prompt reduction in emissions
        - » Decreasing supply of allowances (given a constant demand) will make the carbon “input” more expensive. This will result in making cleaner technologies and carbon avoidance economically viable.
- Offsets
  - Issuance of offsets by recognized NGOs for approved projects
    - Projects must prove that they are **additional** ( BOTH environmentally and economically)
    - Either UN Certified Emissions Reductions (CER) or voluntary offsets certified by approved entities (VCU, CRT, ACR, etc)
      - Not all offsets are created equally
    - Regulator caps percentage of Offsets that can be used to cover emissions liability. AB 32 currently envisions 4%. EU countries average 13%

# The Carbon Offset Market - Channels

Generalized Carbon Offset Supply Chain



# Recordkeeping & Reporting





# It's Not Just Carbon State RPS Standards

State	Amount	Year	Organization Administering RPS
Arizona	15%	2025	<a href="#">Arizona Corporation Commission</a>
California	33%	2030	<a href="#">California Energy Commission</a>
Colorado	20%	2020	<a href="#">Colorado Public Utilities Commission</a>
Connecticut	23%	2020	<a href="#">Department of Public Utility Control</a>
District of Columbia	20%	2020	<a href="#">DC Public Service Commission</a>
Delaware	20%	2019	<a href="#">Delaware Energy Office</a>
Hawaii	20%	2020	<a href="#">Hawaii Strategic Industries Division</a>
Iowa	105 MW		<a href="#">Iowa Utilities Board</a>
Illinois	25%	2025	<a href="#">Illinois Department of Commerce</a>
Massachusetts	15%	2020	<a href="#">Massachusetts Division of Energy Resources</a>
Maryland	20%	2022	<a href="#">Maryland Public Service Commission</a>
Maine	40%	2017	<a href="#">Maine Public Utilities Commission</a>
Michigan	10%	2015	<a href="#">Michigan Public Service Commission</a>
Minnesota	25%	2025	<a href="#">Minnesota Department of Commerce</a>
Missouri	15%	2021	<a href="#">Missouri Public Service Commission</a>
Montana	15%	2015	<a href="#">Montana Public Service Commission</a>
New Hampshire	23.80%	2025	<a href="#">New Hampshire Office of Energy and Planning</a>
New Jersey	22.50%	2021	<a href="#">New Jersey Board of Public Utilities</a>
New Mexico	20%	2020	<a href="#">New Mexico Public Regulation Commission</a>
Nevada	20%	2015	<a href="#">Public Utilities Commission of Nevada</a>
New York	24%	2013	<a href="#">New York Public Service Commission</a>
North Carolina	12.50%	2021	<a href="#">North Carolina Utilities Commission</a>
North Dakota*	10%	2015	<a href="#">North Dakota Public Service Commission</a>
Oregon	25%	2025	<a href="#">Oregon Energy Office</a>
Pennsylvania	8%	2020	<a href="#">Pennsylvania Public Utility Commission</a>
Rhode Island	16%	2019	<a href="#">Rhode Island Public Utilities Commission</a>
South Dakota*	10%	2015	<a href="#">South Dakota Public Utility Commission</a>
Texas	5,880 MW	2015	<a href="#">Public Utility Commission of Texas</a>
Utah*	20%	2025	<a href="#">Utah Department of Environmental Quality</a>
Vermont*	10%	2013	<a href="#">Vermont Department of Public Service</a>
Virginia*	12%	2022	<a href="#">Virginia Department of Mines, Minerals, and Energy</a>
Washington	15%	2020	<a href="#">Washington Secretary of State</a>
Wisconsin	10%	2015	<a href="#">Public Service Commission of Wisconsin</a>

Renewable Portfolio Standards (RPS) are legislated requirements imposed on electricity producers to generate a minimum amount of their output from renewable sources. In lieu of generating from renewable sources the producers can purchase Renewable Energy Credits (RECs).

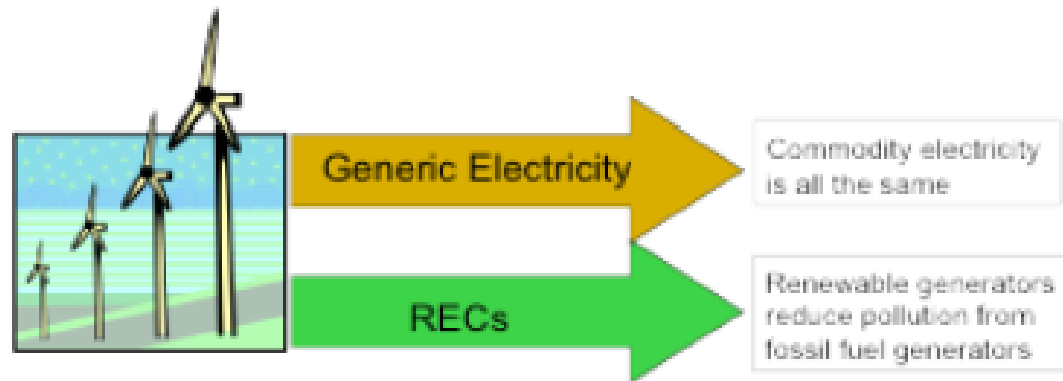
NOTE: \*Five states, North Dakota, South Dakota, Utah, Virginia, and Vermont, have set voluntary goals for adopting renewable energy instead of portfolio standards with binding targets.

# What Are RECs (Renewable Energy Credits)?

For every kilowatt hour of electricity a renewable generator generates, it also generates a one-kilowatt hour renewable energy credit. The generator can sell both commodities together as "renewable electricity" or sell the electricity as "generic" electricity to one buyer and the RECs to other buyers. **Legally, it's all about who owns the RECs**

[See a picture at the retail utility level](#)

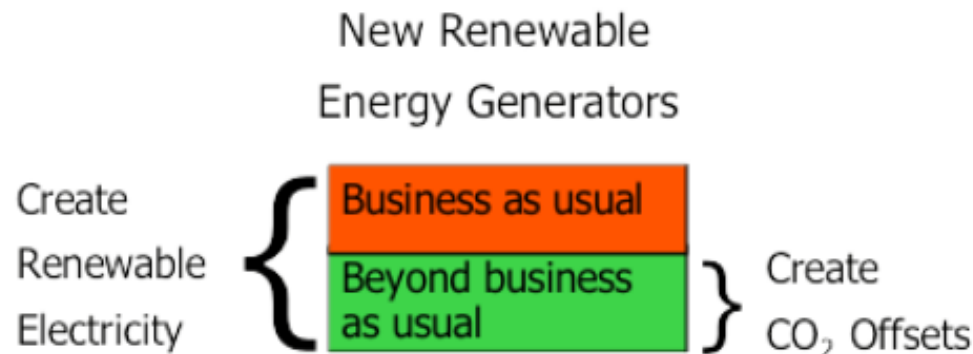
Renewable generators produce two commodities:



RECs - the exclusive legal right to claim that a unit of electricity is renewable, and to claim responsibility for the environmental benefits it produces

# Difference Between REC's and Carbon Offsets

All RECs from qualifying new generators represent the environmental attributes of renewable power, principally the fact that producing that power causes less, or no, pollution. When you buy an amount of wind-generated RECs equal to your electricity consumption, you are legally entitled to claim that you are wind powered, and that your electricity use does not contribute to global warming. In other words, all wind RECs can convert your electricity to wind power. However, for a REC to be used to offset emissions from driving, flying or heating your home, it must be from a project that would not have been implemented without the opportunity to realize revenues for the carbon reductions (in other words, it must be "additional" to business-as-usual - see "what's the importance of additionality, below"), and not all renewable energy projects can say that.



The other difference is that carbon offsets can be from non-electric sources, such as using heat given off by electric generators to reduce fossil fuel use, stopping emissions of methane (a powerful greenhouse gas) from stored manure or landfills, or sequestering carbon in forests.

**An important additional distinction is that RECs have a term set by each state.  
The term is typically three years.**

# Additional Resources

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- *EPA Write-Up on Cap & Trade*
  - <http://www.epa.gov/capandtrade/>
- *Carbon Disclosure Project reports*
  - <https://www.cdproject.net/CDPResults/CDP%202009%20SandP500%20Report.pdf>
- *BNY Mellon Environmental Home Page*
  - <http://www.bnymellon.com/environmentalsolutions/index.html>
- *Carbeion Home Page*
  - <http://www.carbeion.com/index.php>
- *NextEra Energy Home Page*
  - <http://nexteraenergyresources.com/>
- *Database of State Incentives For Renewable Energy*
  - <http://www.dsireusa.org/>
- *Western Climate Initiative*
  - <http://westernclimateinitiative.org/>
- *Regional Greenhouse Gas Initiative*
  - <http://www.rggi.org/home>

# Contact Information

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