

Untangling the Interaction between Renewable Energy Markets/Policies and Emission Cap & Trade Regulation

Preserving the Emission Benefits of Renewable Energy

Bob Grace, Sustainable Energy Advantage, LLC
Tom Rawls, THR Associates, LLC

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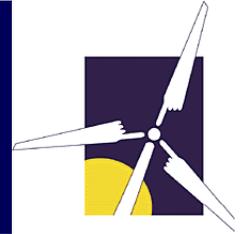
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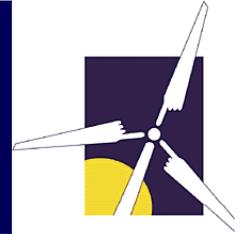
Executive Summary



- **Renewable Portfolio Standard (RPS), Renewable Energy Credits (RECs), and emission Cap & Trade (C&T) programs are rapidly growing platforms widely perceived as a boon for wind energy. Analysis reveals, however, that their poorly coordinated interaction is widely misunderstood, leading to increased commercial uncertainty and implementation of policies which may not yield the results expected by policymakers.**
- **Cap & Trade programs may not recognize emission benefits of wind, potentially limiting wind's claims to greenhouse gas (GHG) or other emission reductions. The specifics of policy and market design dictate the mechanism through which wind may benefit financially from these policies, as well as the magnitude of those benefits.**
- **Using analysis of the current landscape, we present clear definitions and a framework for clearly articulating the relationships among RPS, REC and emissions markets in a meaningful and consistent way. This framework can address current constraints while:**
 - ❖ **Allowing policymakers to create policies and markets which yield their intended result;**
 - ❖ **Working with existing and conceived tracking systems;**
 - ❖ **Clarifying options for trading and contracting for wind energy “attributes” and their implications;**
 - ❖ **Making transparent the benefits of wind and other renewable energy resources as emission reducers, and thereby allowing wind to make the emission claims desired even in the presence of cap & trade programs.**
- **Using the framework presented, clear articulation of policy objectives is critical to effective implementation. The details matter!**
- ***Note: While this presentation references wind, it applies generally to any incremental zero-emission renewable energy source.***

A Tale of Two Worlds...

Will RE and C&T Policies & Markets Work Together?



Renewable Energy

RPS Requirements,
Voluntary Green Power (**GP**)

Currency: Tradable Renewable
Energy Credits (**RECs**)

- Evidence of 1 MWh of generation
- Carry emission & other “direct” attributes

Tracking: REC registry

Emission Policies

‘Cap & Trade’ (**C&T**)

Is C&T indifferent to wind benefits?

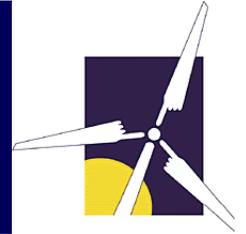
→ Emissions benefit must be formally recognized, or wind unable to produce, claim or be compensated directly for benefits

Currency: ‘Tradable Emission
Commodities’ (**TECs**)

- e.g. allowances, offsets, VERS...
- Created by regulation, recognize emission benefits

Tracking: Emission registry

Cap & Trade Programs May Not Recognize Wind's Benefits, Potentially Eliminating Wind's Ability to Cause & Claim Emission Reductions



Without Cap & Trade (C&T)

- wind displaces production, reducing emissions from marginal fossil fuel resources
- valid emission reduction claim quantified by modeling...

With cap & trade policies

- how do air quality benefits of RE get recognized & compensated?

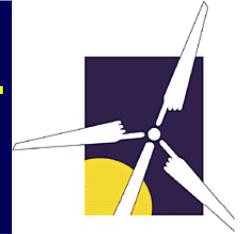
Key Commercial Questions

- ✓ How does wind get recognized for producing emission-free generation?
- ✓ How does wind receive compensation for benefits created?
 - ✓ Sale of REC for RPS?
 - ✓ Sale of REC for RPS + sale of TEC?
 - ✓ Sale of REC for RPS + increase in market prices of energy?
- ✓ If wind's benefits not recognized, what do green power marketers have to sell? Why would customers buy?

Key Policy Questions

- ✓ Will Cap & Trade policies...
 - Remove wind from emissions-reduction toolbox?
 - Negate ability for wind to make emission reductions claims?
 - Kill the voluntary RE market?
- ✓ Is RPS an emission reduction tool?
 - If yes, how does it get integrated into GHG C&T rules?
- ✓ Will RE policies have their intended result?

Problem #1: “Generation-” or “Environmental-attributes” are Insufficiently Precise Terms



Two different categories of “attributes”

Primary Attributes (PA)

Characteristics of the unit

Unique (no more info needed)

Look at the generator (“Wind”)

Actual emissions (“zero”)

Location, vintage, RPS Eligibility, etc.

Tracked by REC tracking systems (a.k.a. Generation Info. Systems, GIS)

Derived Attributes (DA)

Impacts or benefits to the system

Need additional info

Interaction with the system, and/or policy to determine benefit

Without C&T: Displaced emissions estimated by dispatch study

With C&T: administratively determined

Not tracked by GIS

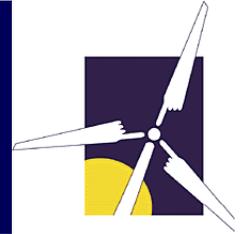
→ **RECs cannot universally “include” derived attributes, which vary...**

- Presence or absence of C&T policy... differ among states, pollutants
- TECs not universally conveyed (e.g. exemptions, set-aside allowances)
- Where load is served determines what is displaced
- Usage by REC buyer (e.g. RPS vs. GP) not known at creation

→ **Basic definition of a REC aligns with bundle of primary attributes**

- If **TECs** created, can attach to “basic” **REC**, e.g. for CA RPS compliance or GP sales

Problem #2: Policy Conflicts & Uncertainty



- Policies established without....
 - Clear statements of objectives → e.g. Is purpose of RPS to reduce greenhouse gas (GHG) emissions?
 - Clear regulatory structure to accomplish the objective
- Creates questions... e.g.,
 - Does wind reduce emissions under RGGI or California GHG C&T?
- Broad lack of consistency between and within states
 - One agency or branch may not understand what others have done

Federal SO₂

- Wind gets no TECs
- No emission reductions can be claimed

NO_x (Clean Air Interstate Rule)

- Wind can seek limited TECs through set-asides, in some states (must apply)
- Emission reduction benefits depend on distribution & usage

Regional Greenhouse Gas Initiative (RGGI)

- Wind gets no TECs
- Projection of existing RPS compliance presumed in setting targets and quantity of allowances created
- *Optional* GP clause in model rule → TECs “set-aside”, auto-retired for GP sales, enabling buyer to make “claim” (will states adopt?)
- Role of future RPS has not been addressed!

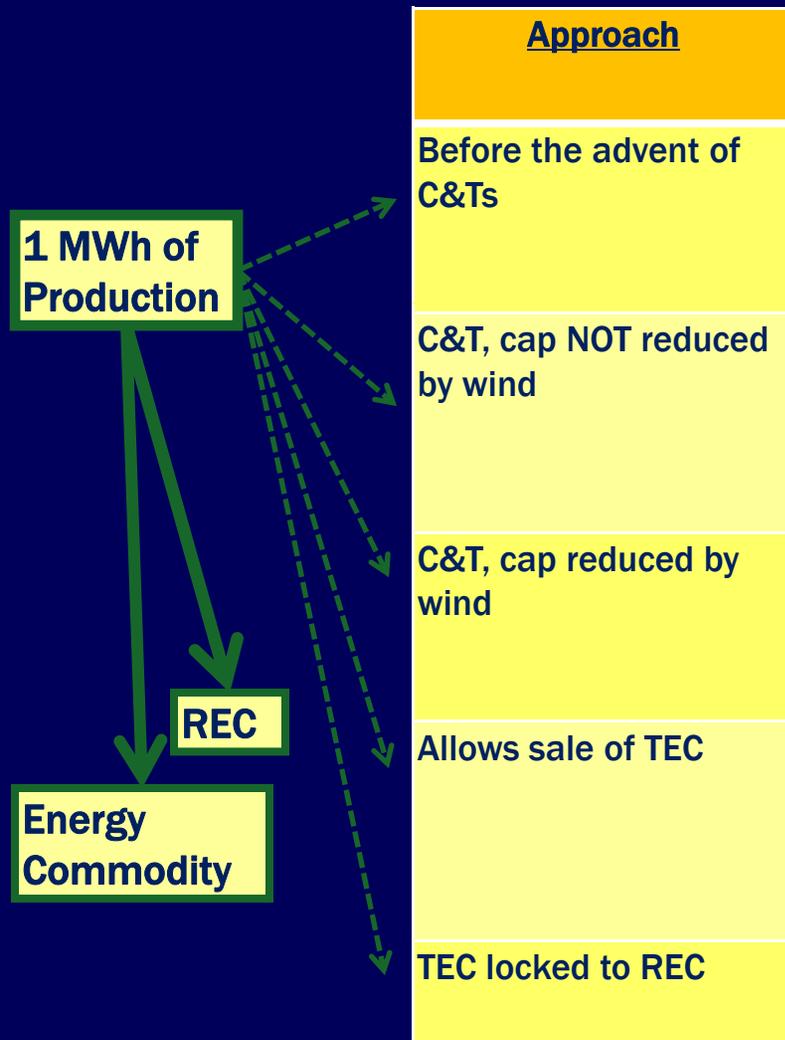
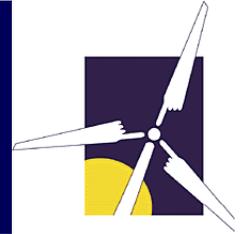
Problem #3: Commercial Uncertainty

- **With policy uncertainty, buyers & sellers both seek Derived Attributes**
 - Confusion increasingly confounds contract negotiations between attribute buyers & sellers (what needed, how to document/verify?)
- **Will TECs yield a supplemental revenue stream?**
- **For wind generator, is it beneficial to have a **TEC** if already have a market for **RECs**?**
 - In efficient market, would value of **REC** would drop by value of **TEC**? Do those seeking both **REC** and **TEC** revenue streams win only through market inefficiencies?
 - Does support for RPS decline without GHG reductions as benefit?

Problem #4: Can wind buyers claim emission reductions?

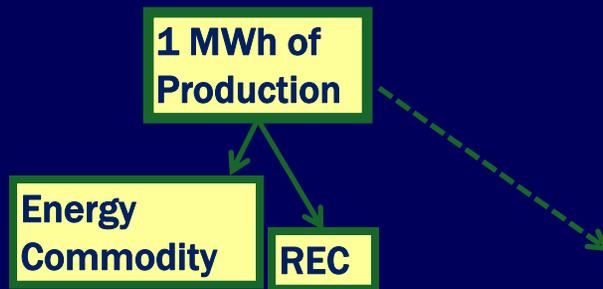
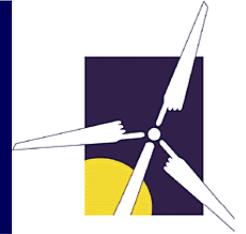
- **GP buyers use RE to neutralize carbon footprint**
 - Market is growing fast
 - Includes major businesses, federal and state governments
 - EPA promotes voluntary sales
 - States are using RE to meet GHG goals (e.g. CT)
- **C&Ts must reduce the cap, or allocate & retire **TECs** as a result of ‘green power’ sale to produce a clear RE emission reduction, enable the “claim”**
 - Will GHG policy undermine this market?
- **Threat to RE siting**
 - If RE does not reduce GHG, are communities less willing to accept perceived burdens of hosting wind?

Today's Landscape: 5 distinct (and often conflicting) approaches in use today!



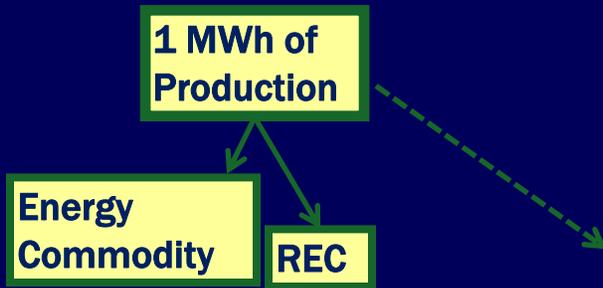
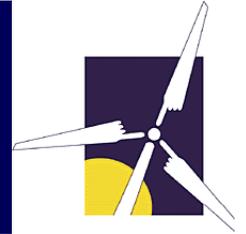
- Models in current use differ in treatment of Derived Attributes (or TECs if created), and include:
 - Before the advent of C&Ts
 - C&T, cap NOT reduced by wind
 - C&T, cap reduced by wind
 - Allows sale of Derived Attributes (or TECs if created)
 - TEC locked to REC

Approach: Before the Advent of C&Ts



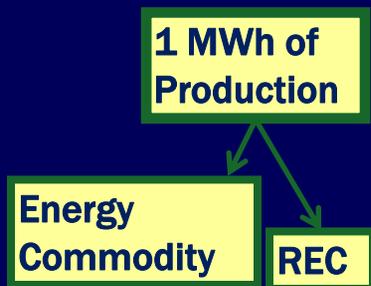
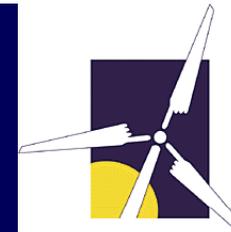
<u>Approach</u>	<u>Before the Advent of C&Ts</u>
Example	Most states
TECs Created?	No framework for treatment of Derived Attributes
How Wind Benefits	Single revenue stream for REC; GHG benefit implied with REC
What Wind Claims	Wind reduces emissions (displacement)

Approach: C&T, Cap NOT Reduced by Wind



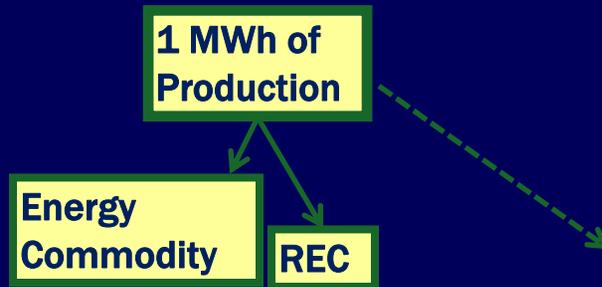
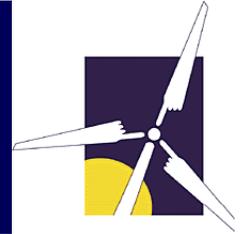
<u>Approach</u>	<u>C&T, cap NOT reduced by wind</u>
Example	Voluntary GP under RGGI <u>unless</u> optional GP clause adopted; Federal SO ₂ ; NO _x w/o set-aside allowances
TECs Created?	No
How Wind Benefits	Value of wind production is higher due to increased energy prices (No direct C&T revenue)
What Wind Claims	No clear emission reduction claim; lower total compliance cost

Approach: C&T, Cap Reduced by Wind



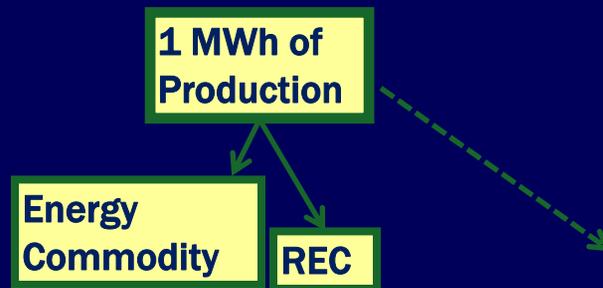
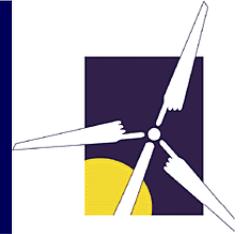
<u>Approach</u>	<u>C&T, cap NOT reduced by wind</u>
Example	RGGI treatment of pre-existing RPS targets (imprecise)
TECs Created?	Reduce the Cap or # of Allowances
How Wind Benefits	Higher value of wind production due to increased energy prices
What Wind Claims	Wind reduces emissions

Approach: Allows sale of Derived Attributes (or TECs if created)



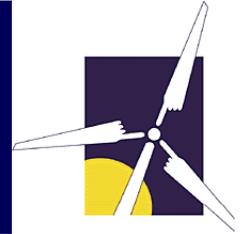
<u>Approach</u>	<u>Allows sale of DA/TEC</u>
Example	RPS in DE, MA, MD, PA, RI; Allowances allocated to wind (e.g. set-asides)
TECs Created?	TEC created, independent of REC
How Wind Benefits	C&T allowances to Wind. TEC sale yields additional revenue
What Wind Claims	Wind may not reduce emissions, but lowers total C&T compliance cost

Approach: TEC Locked to REC

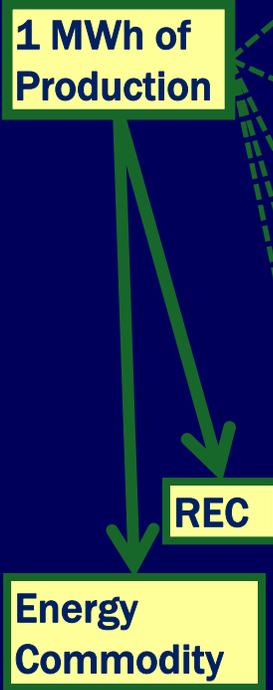


<u>Approach</u>	<u>TEC locked to REC</u>
Example	RPS in AZ, CA, CO, NY, WA
TECs Created?	TEC + REC locked together
How Wind Benefits	Single revenue stream
What Wind Claims	Wind reduces emissions

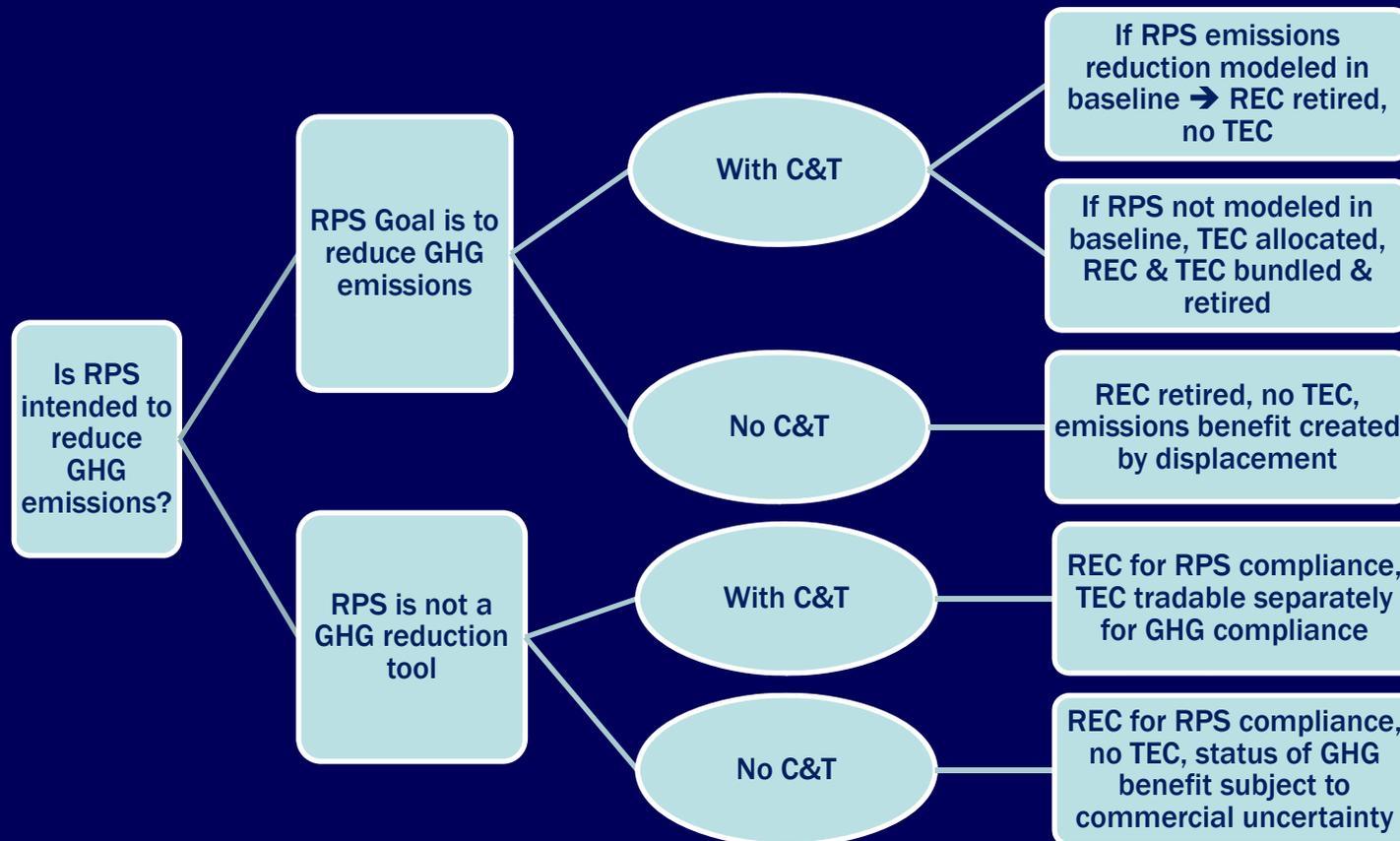
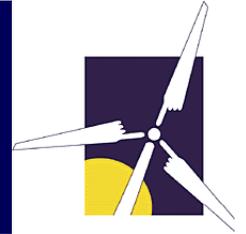
Today's Landscape: Summary



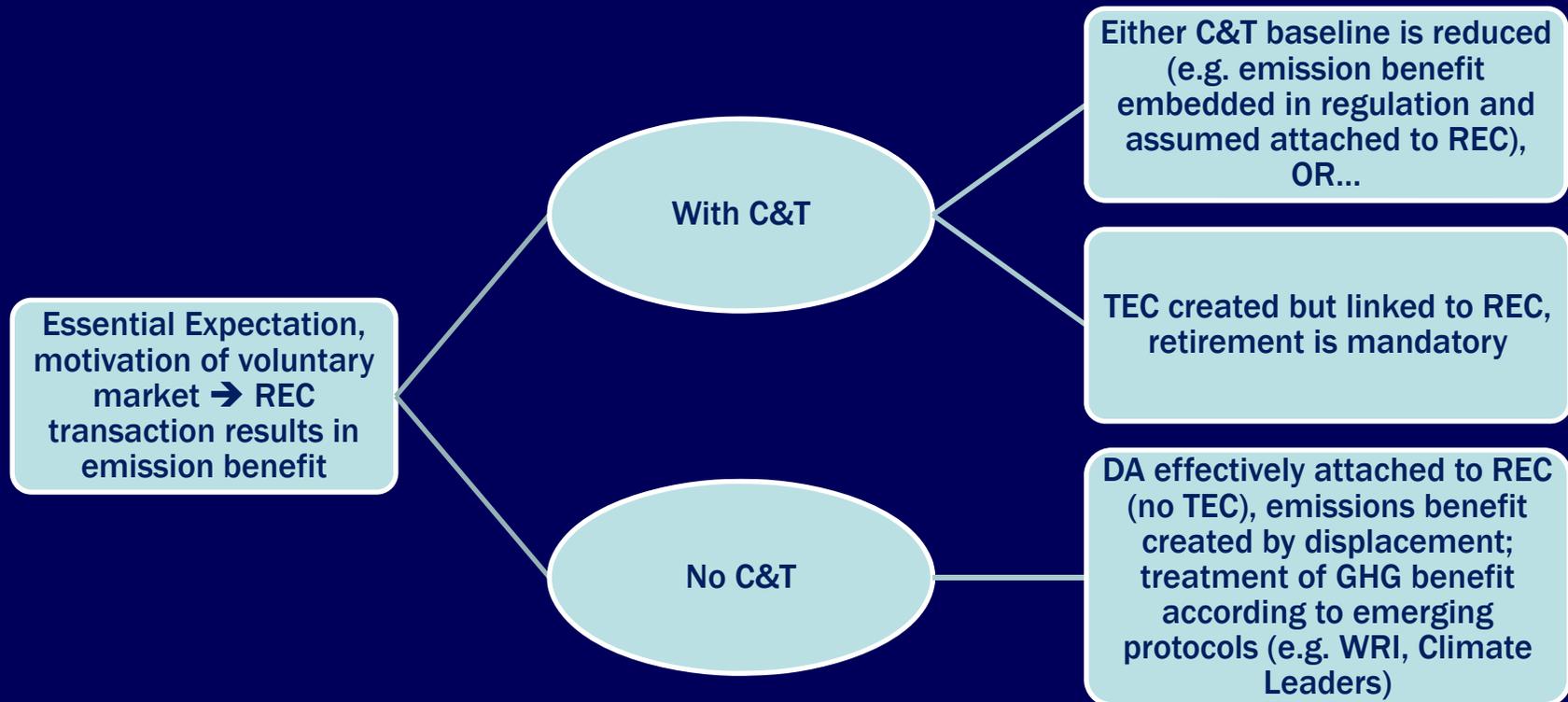
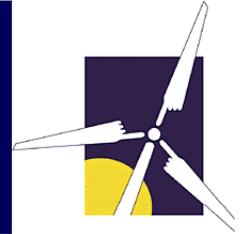
<u>Approach</u>	<u>Example</u>	<u>TECs Created?</u>	<u>How Wind Benefits</u>	<u>What Wind Claims</u>
Wind Before the Advent of C&Ts	Most states	No framework for treatment of Derived Attributes	Single revenue stream for REC; GHG benefit implied with REC	Wind reduces emissions (displacement)
C&T, cap NOT reduced by wind	Voluntary GP under RGGI <u>unless</u> optional GP clause adopted; Federal SO ₂ ; NO _x w/o set-aside allowances	No	Higher value of wind production due to increased energy prices (No direct C&T revenue)	No clear emission reduction claim; lower total compliance cost
C&T, cap reduced by wind	RGGI treatment of pre-existing RPS targets (imprecise)	Reduce the Cap or # of Allowances	Higher value of wind production due to increased energy prices	Wind reduces emissions
Allows sale of TEC	RPS in DE, MA, MD, PA, RI; Allowances allocated to wind (e.g. set-asides)	TEC created, independent of REC	C&T allowances to Wind. TEC sale yields additional revenue	Wind may not reduce emissions, but lowers total C&T compliance cost
TEC locked to REC	RPS in AZ, CA, CO, NY, WA	TEC + REC locked together	Single revenue stream	Wind reduces emissions



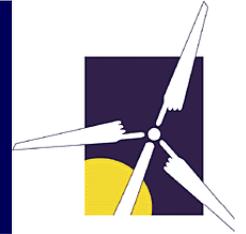
What Should Happen? Integrating RPS and GHG Policies



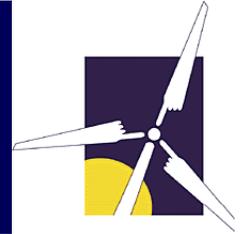
What Should Happen? Marinating the Integrity of Voluntary “Green Power” Purchases



Conclusions



- ❖ Current definitions of RECs & attributes are often imprecise; the role of RECs in carbon/GHG policy is unclear. → Result = Commercial uncertainty.
- ❖ Distinguishing ‘primary’ and ‘derived’ attributes is critical to effective policy design and commercial transactions. RECs carry the bundle of primary attributes; derived attributes (TECs) can be contractually attached to RECs but not inherently included.
- ❖ For market-based policies to function, policymakers need to clarify policy objectives and build policies accordingly.
- ❖ Wind advocates must work to ensure that GHG reduction policies include wind in their design, or benefits may not be recognized or realized.
- ❖ GHG policies may result in more \$ for wind, but will not necessarily result in supplemental revenue for wind.



Bob Grace, Sustainable Energy Advantage, LLC
10 Speen Street
Framingham, MA 01701
tel. 508.665.5855
fax 508.665.5858
bgrace@seadvantage.com
www.seadvantage.com

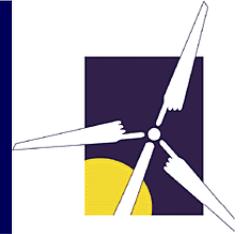
Tom Rawls, THR Associates, LLC
tel. 802.453.4720
rawls@gmavt.net

Appendix



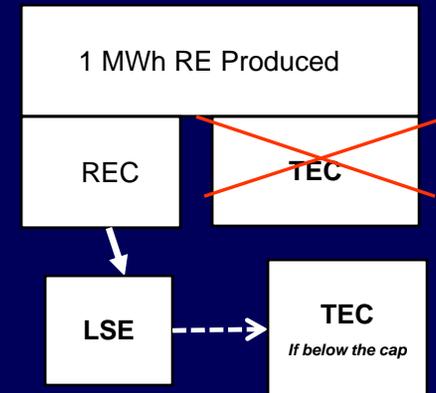
- How does the California “load-based cap” approach fit with this framework?

Load-Based Cap: California's Future Approach



- Requirement applied to load serving entities (LSEs) rather than generator
- Focus on primary attributes (PA) rather than derived attributes (DA)
- A compliance purchase of **RECs** from wind creates space under cap for LSE
- LSE's "Excess" RE purchases can free-up a **TEC**
- Wind generator can decide to:
 - Either sell **REC** with DA bundled to LSE (for compliance) *or* as GP
 - Or sell **TEC** separately
- For Voluntary GP sales: need approach to reduce cap (e.g. like the RGGI voluntary option)

For compliance....



Implications:

- Compliance wind purchase reduces emissions attributed to buyer, but not overall capped emissions
- No TECs or direct C&T revenue for Wind
- No clear emission reduction claims with REC, but wind can claim "zero emission"
- Wind benefits because LSE willing to pay more for RECs (up to market price of allowance)