

# All Sound and Fury?

*A Wind Generators Perspective on the Emerging Carbon Markets*

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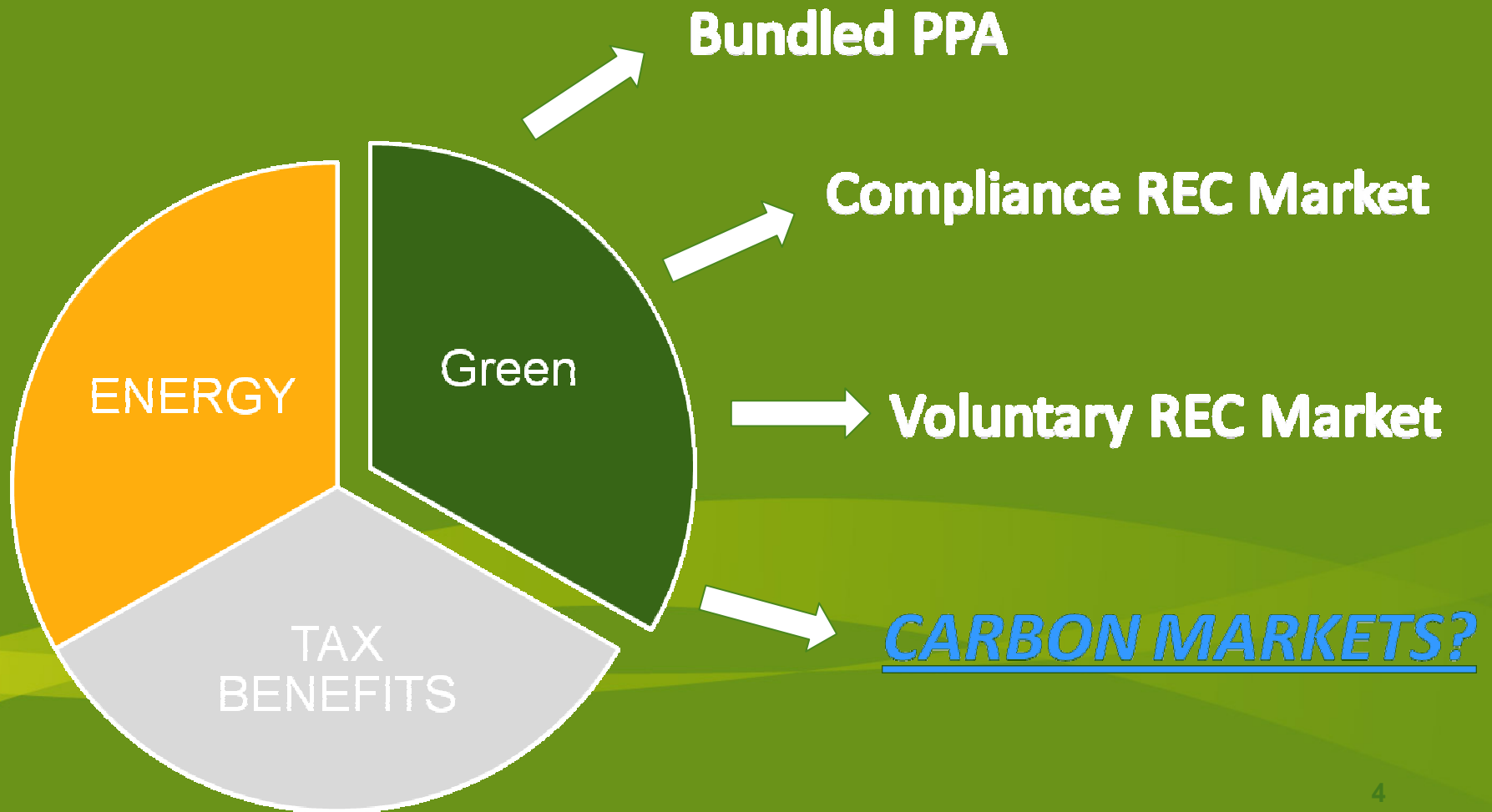
# Presentation Overview

- Carbon from the perspective of utility-scale wind
- Monetizing wind energy without carbon
- Opportunities created by carbon markets
- Challenges to benefitting from carbon markets
- How does carbon change things?

# Utility Wind Perspective

- Capacity = 25MW to 250MW+
- Production = 75,000 to 875,000 MWhs per year
- \$50MM to \$1,000MM in capital investment
- \$5MM to \$50MM in annual revenues (power & RECs)
- Requires long-term revenue certainty
- Pure play generator – i.e. no methane destruction benefits

# Monetizing Wind Energy



# Carbon Market Opportunities



- Wind still not cost competitive in most regions
- Few robust RPS/REC markets
- VER prices significantly above voluntary REC prices
  - National “Green-e” RECs = \$2.50 - \$5.00/MWh
  - Gold Standard VERs = \$15/ton (\$8-\$15/MWh)
- Significant overlap of high carbon/high wind regions
- Cap-and-trade = preference for emission free power

# Carbon Market Challenges

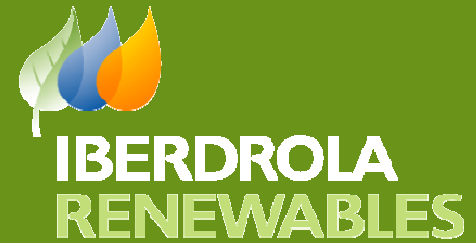
- Cap-and-trade unlikely to provide allowances/offsets
- Uncertainty concerning wind's credentials as VER
- VER market has limited depth and liquidity (so far)
- Contracting in transition to carbon market complex
- Still too much uncertainty



# Does carbon change things?

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- Yes - i.e. not all “Sound and Fury”
- VER could boost wind revenues in short-term
- Cap-and-trade could improve economics in long-term
- Will likely be winners and losers based on geography
- Both voluntary and compliance have long way to go
- Still time to shape carbon markets, particularly voluntary



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