



# Corporate Demand for Renewable Energy Trends, Outlook and Challenges

October 4, 2017

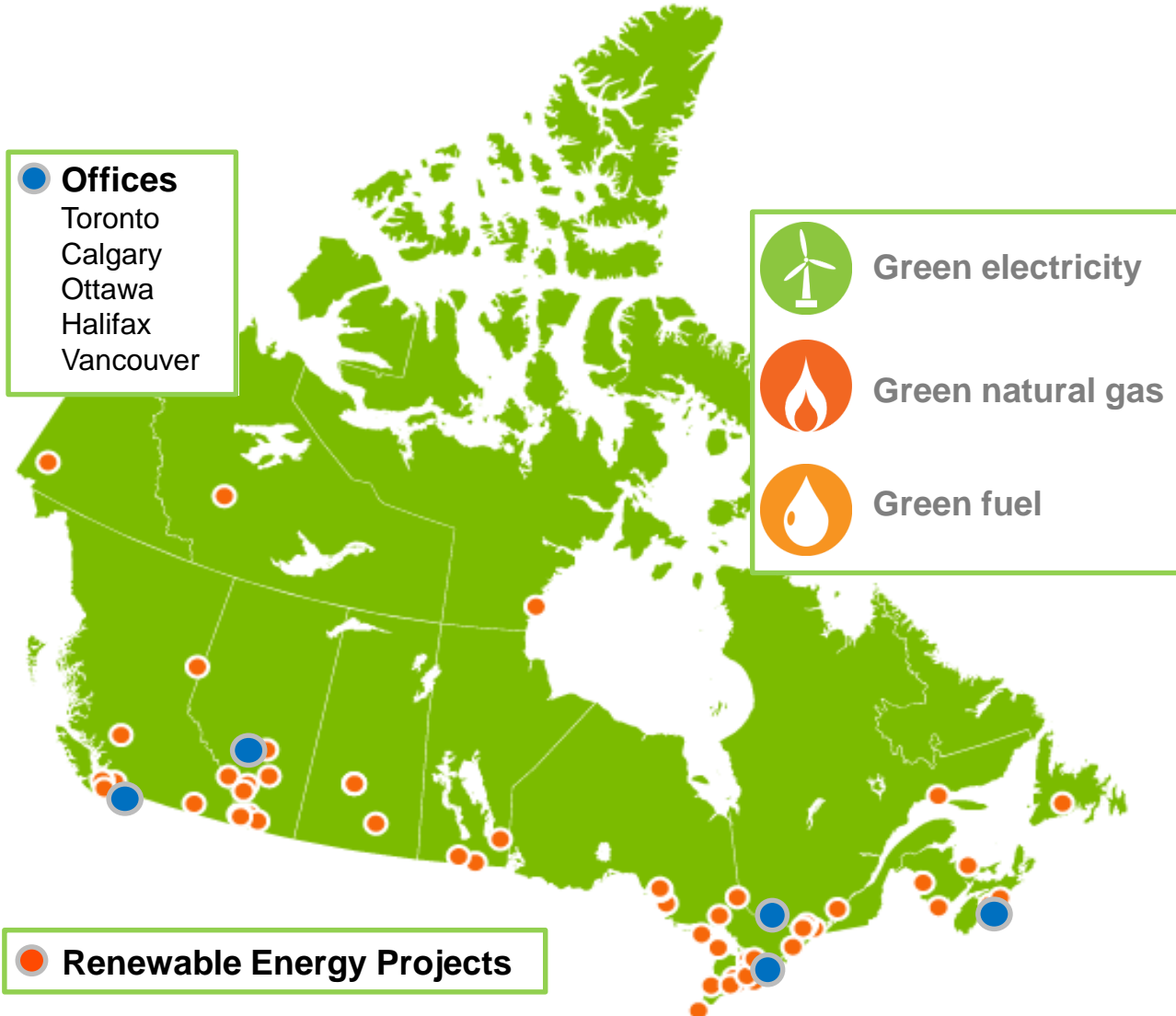


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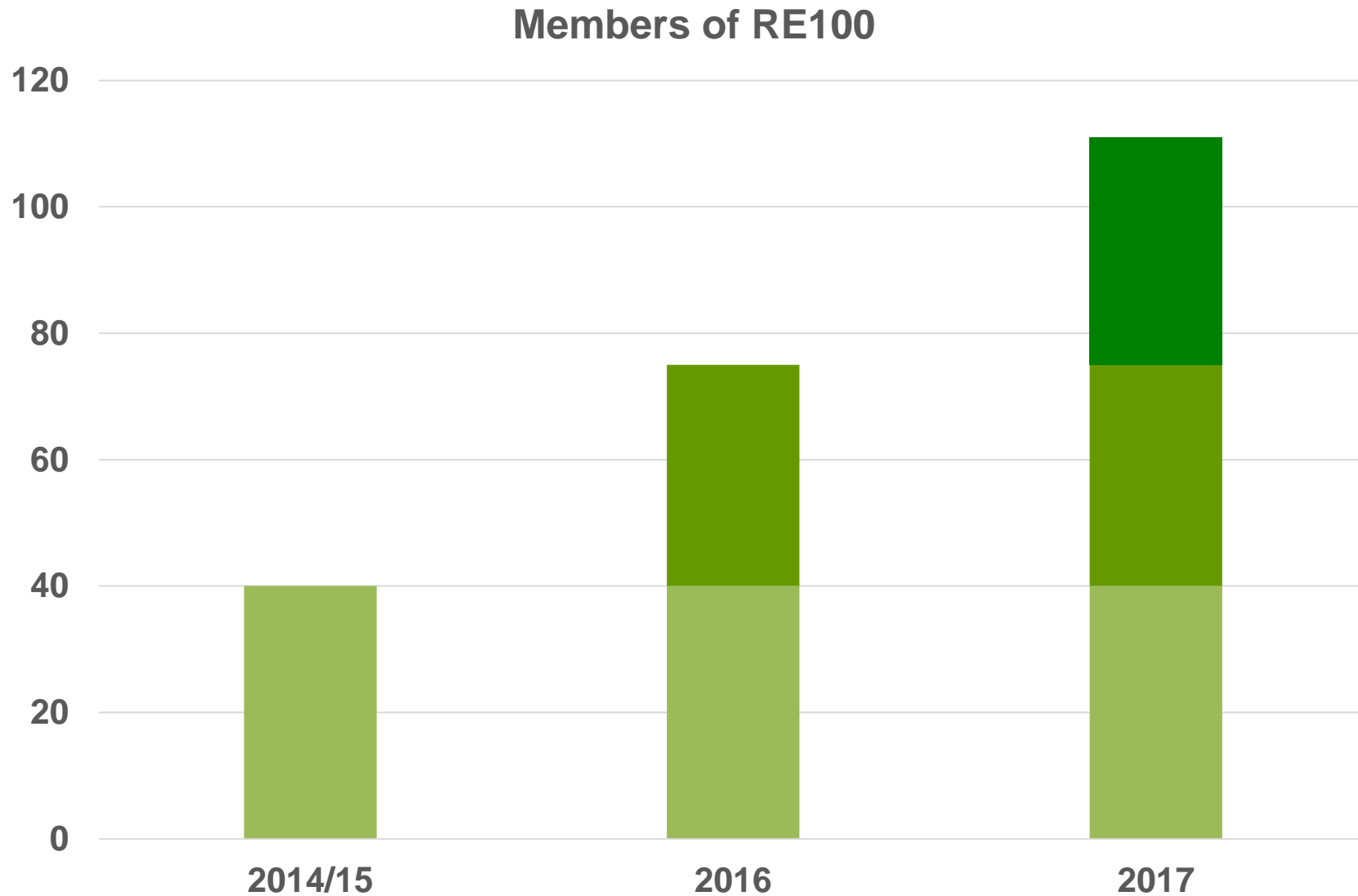
## Bullfrog at a glance

Canada's leading renewable energy provider for the voluntary market; more than 1,600 commercial customers.



## Globally, more corporate commitments to renewables

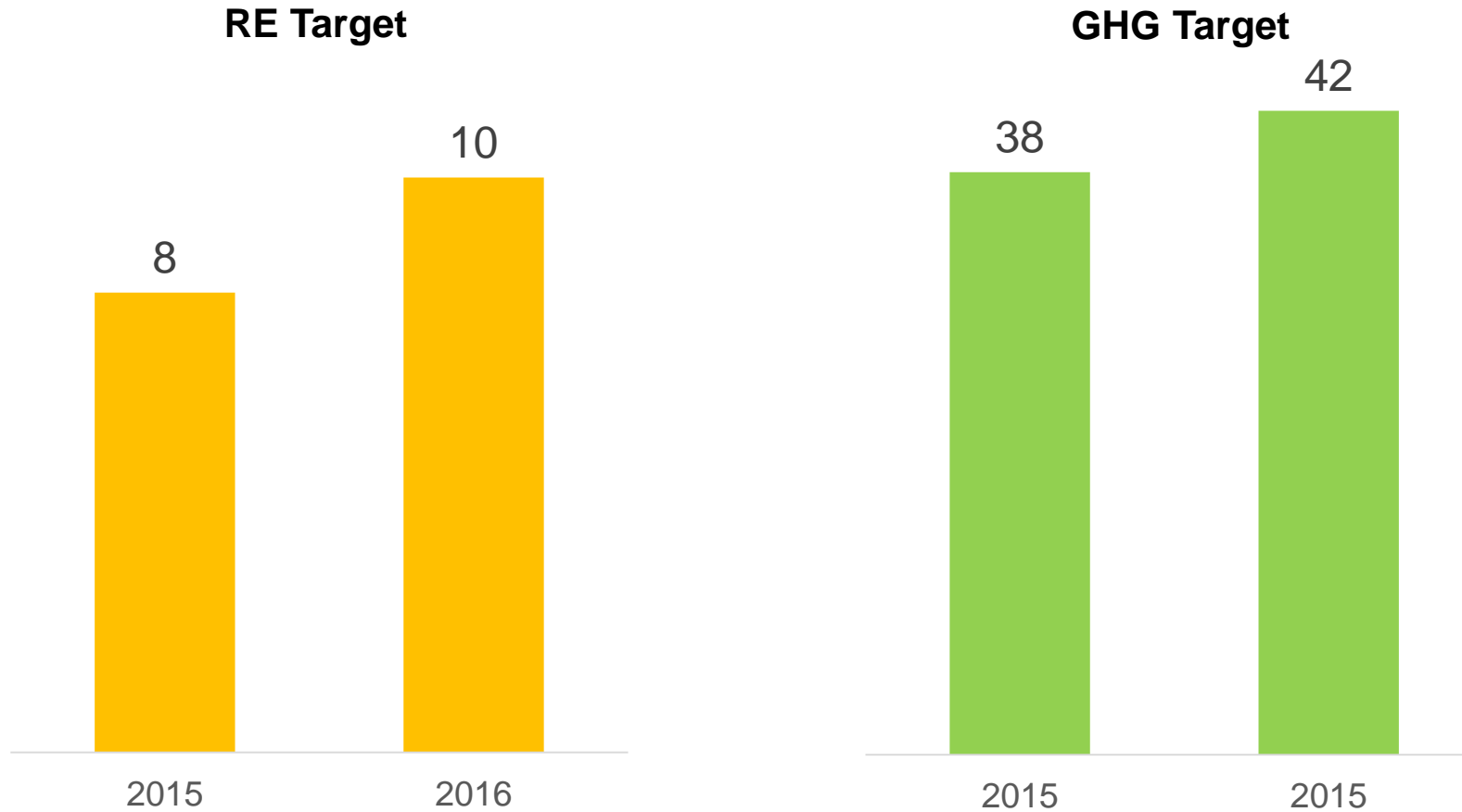
Membership in RE100 has increased from 40 firms at the end of 2015 to 100 in July of this year and 111 today.



## Growth also in softer targets

More companies are committing to a portion of renewable energy, or specific GHG reductions.

### % of Fortune 500 companies committing to:



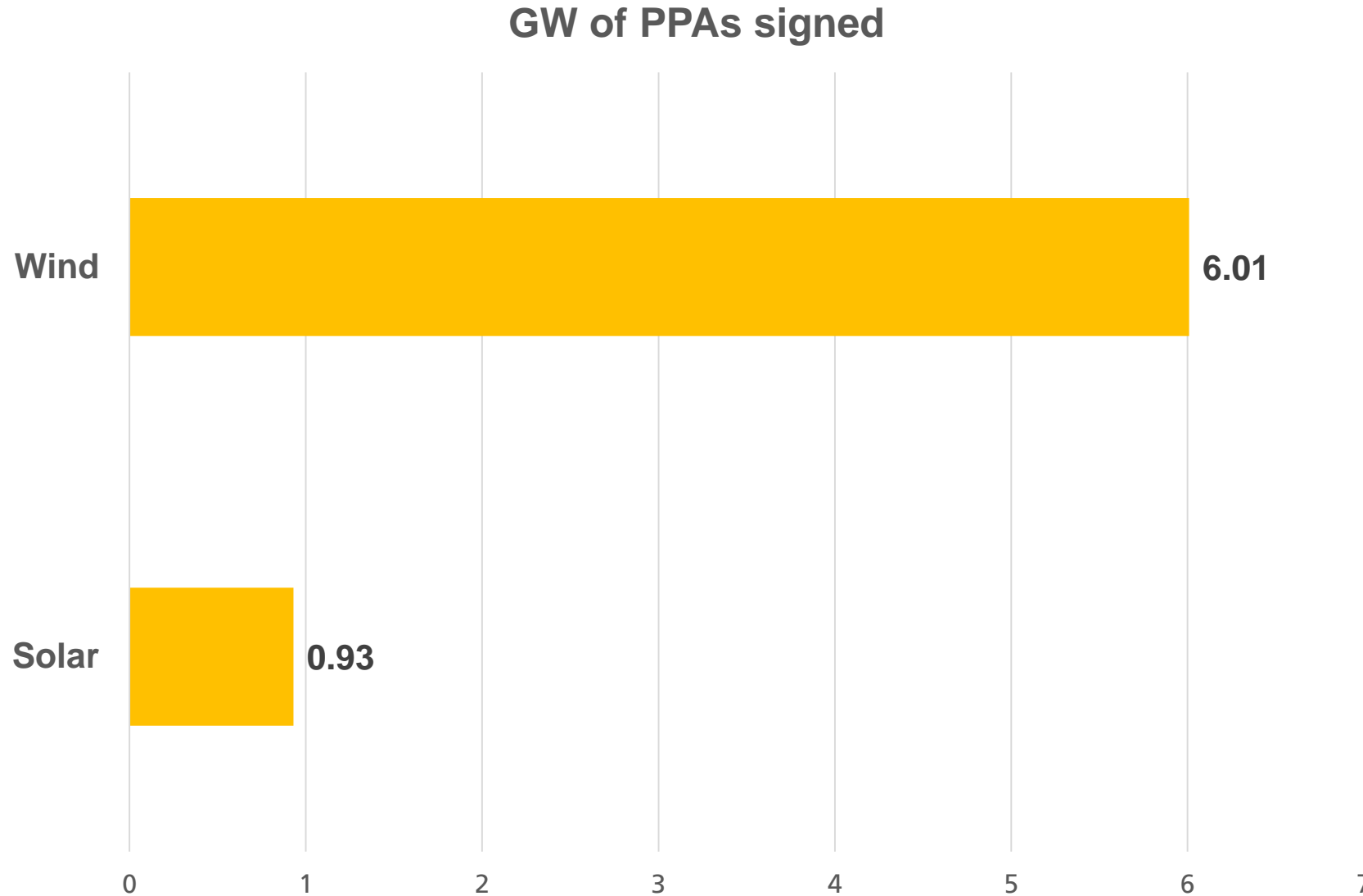
## Challenge: Commitment time frames are often distant

Close to half of RE100 signatories have no specific time frame on their commitment, and only ~ ¼ are planning to meet the commitment earlier than 2030.



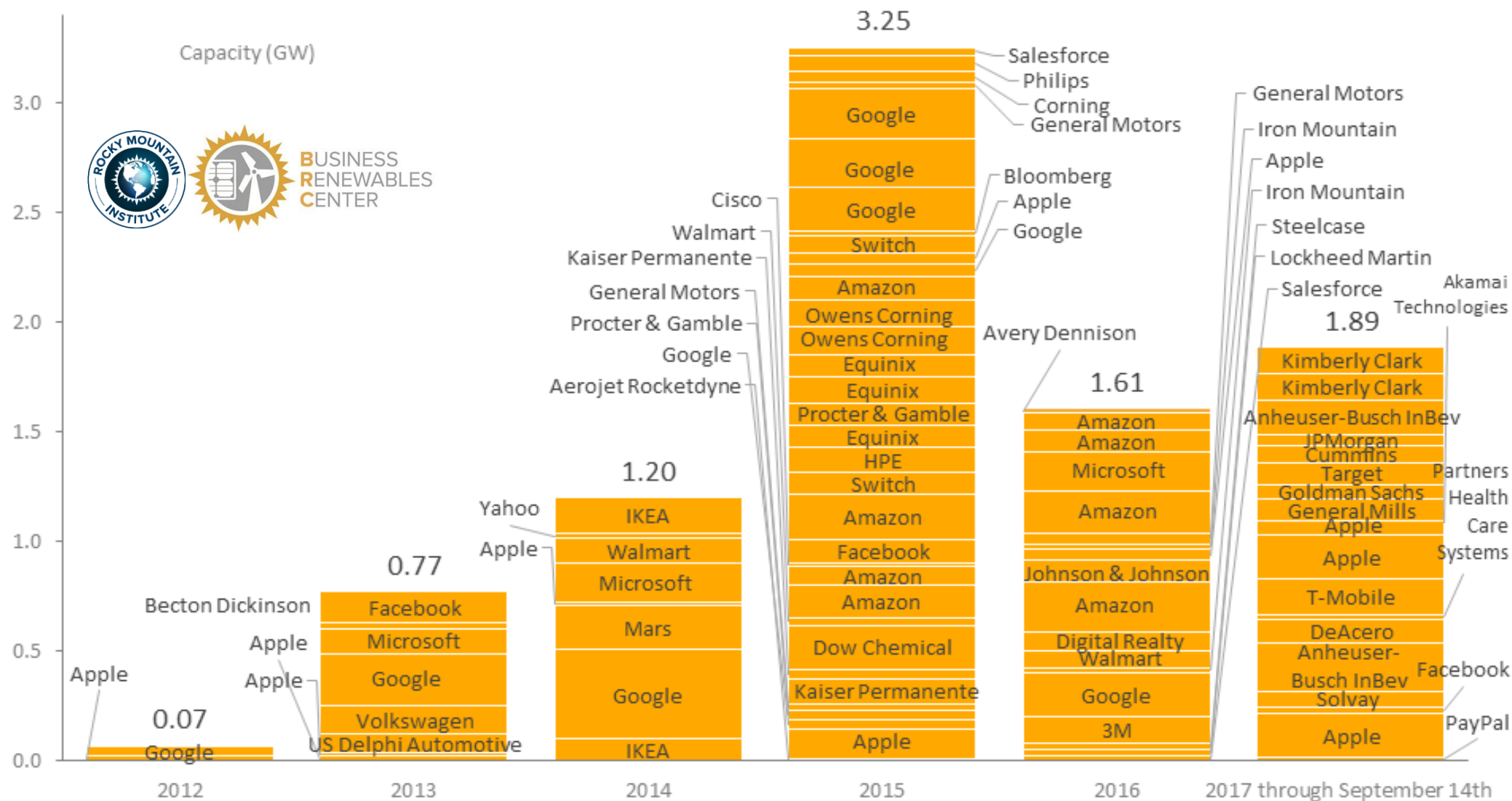
## Wind has been the key driver of corporate renewable procurement

Roughly 85% of corporate PPAs signed in the U.S. between 2008 and 2016 were for wind power.



# Corporate buyers signing PPAs for renewables

Annual U.S. market ~2 GW.

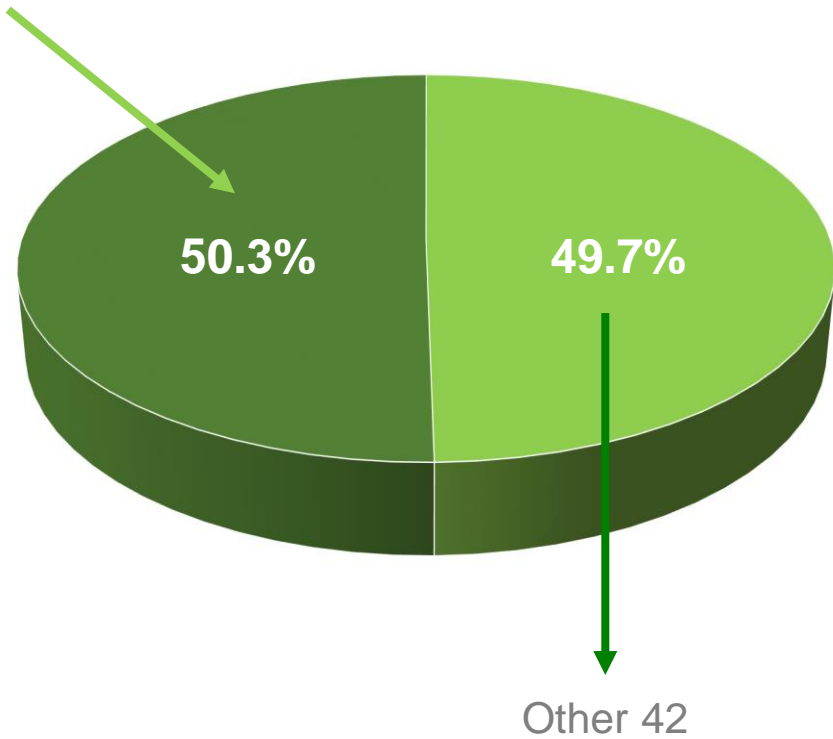


Source: RMI BRC

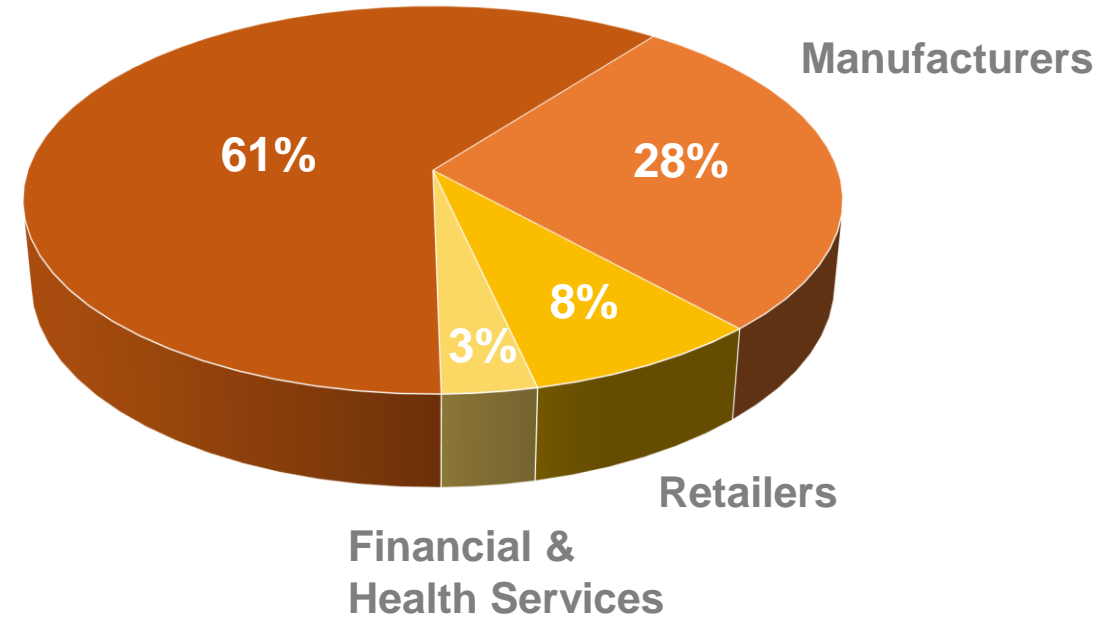
## Procurement focused on data centres and factories

Large, concentrated loads; brand exposure; sophisticated buyers.

Big Five: Google, Amazon, Apple, Microsoft, Walmart



Tech / Data Centres





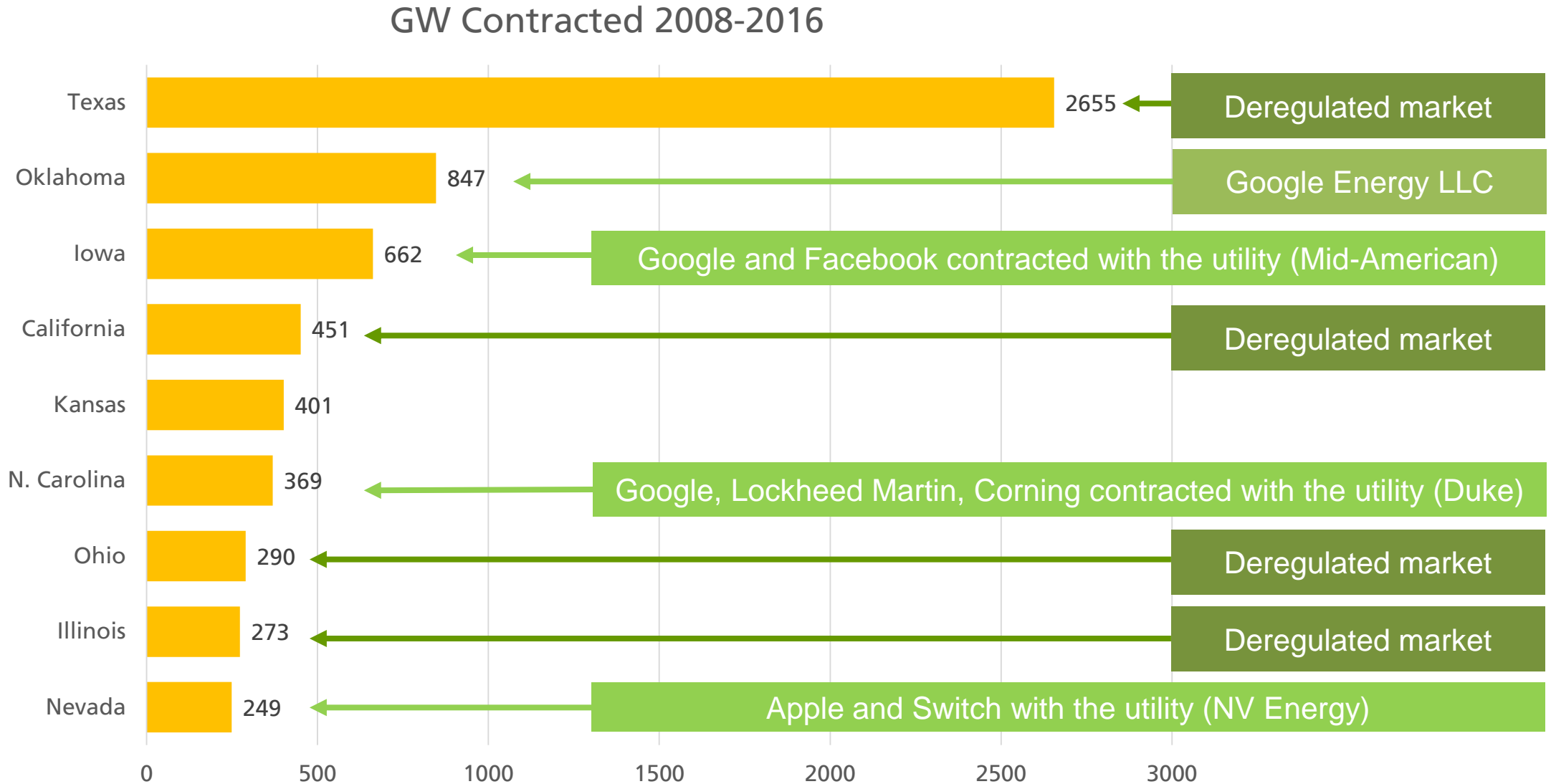
## Of 15 buyers this year, 13 were doing their first deal

Buyer	Capacity (MW)
Google	1861
Amazon	1135
Apple	764
Microsoft	463
Walmart	387
Anheuser-Busch InBev	372
Equinix	330
Facebook	274
IKEA	263
Owens Corning	250
Kimberly Clark	245
Mars	200
Dow Chemical	200
Switch	179
T-Mobile	160
Kaiser Permanente	153
Procter & Gamble	138
Volkswagen	130
3M	120
General Motors	114
HPE	112
DeAcero	110
General Mills	100
Johnson & Johnson	100

Buyer	Capacity (MW)
Target	100
Digital Realty	88
US Delphi Automotive	80
Cummins	75
Solvay	71
Philips	70
Goldman Sachs	68
Salesforce	64
JPMorgan	55
Iron Mountain	52
Corning	50
Becton Dickinson	30
Lockheed Martin	30
Steelcase	25
Yahoo	23
Partners HealthCare	22
Avery Dennison	20
Bloomberg	20
Cisco	20
PayPal	15
Aerojet Rocketdyne	12
SC Johnson	11
Akamai Technologies	7

## Challenge – Economics, regulations and power prices limit viable geographies

Texas has been home to as much corporate PPA development as the next 5 largest states combined. The top 4 states account for 50% of all PPAs; the top 9 account for two-thirds.



## Challenge: Threading the contract needle

### Seller Needs & Wants

- Creditworthy counterparty (investors accustomed to utility-backed PPAs) with risk-adjusted return
- Long-term agreements (10~20 years)
- Price settlement at (a single) location where power is injected into the grid
- Guaranteed volumes / full offtake

### Buyer Needs & Wants

- Cost neutral or savings, with price hedge
- Ideally, contract duration that does not require Board approval (< 5 years)
- Price settlement at location where power consumed
- Volume flexibility, should load grow or decline
- Coverage for 100% of operations, spanning multiple jurisdictions
  - Canadian facilities more likely to be smaller, more distributed than in U.S.

**Aggregation of offtake parties can provide scale, risk mitigation, variety in contract durations, volume flexibility**