



# Program Update

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# SF<sub>6</sub> Emission Reduction Partnership for Electric Power Systems

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- ▶ Since 1999, members of the U.S. electric power industry and the U.S. Environmental Protection Agency (EPA) have been working together to identify and implement opportunities to reduce SF<sub>6</sub> emissions.
  - ▶ SF<sub>6</sub> classified as the highest GWP gas (GWP of 22,800 IPCC Fourth Assessment Report).
  - ▶ Extremely long atmospheric lifetime of 3,200 years causes it to accumulate in the earth's atmosphere for centuries.
- ▶ **90** partners
  - ▶ 47 partner reporting entities reported to GHGRP in 2015 (representing 95% partnership emissions).
- ▶ Partners are leaders in their industry in efforts to reduce SF<sub>6</sub> emissions.
- ▶ Voluntary action under the Partnership has yielded impressive results.

# Partners

**American Electric Power (AEP)**  
**Arizona Public Service Company (APS)**  
**Athens Electric Department**  
**Austin Energy**  
**Big Rivers Electric Corporation**  
**Bonneville Power Administration**  
**California Department of Water Resources**  
**CenterPoint Energy**  
**Central Maine Power Company**  
**City of Palo Alto Utilities**  
**Consolidated Edison Company of New York**  
**CPS Energy (formerly San Antonio City)**  
**Duquesne Light Company**  
**Edison International**  
**El Paso Electric Company**  
**Emera Maine**  
    Bangor Hydro-Electric Company  
    Maine Public Service Company  
**Entergy Corporation**  
**Eugene Water and Electric Board**  
**Eversource Energy**  
    Boston Edison Company (formerly under NIPSC)  
    Cambridge Electric Light Company  
    Commonwealth Electric Company (formerly under NIPSC)

**Eversource Energy (cont.)**  
    NSTAR Electric and Gas  
**Exelon Energy Delivery (EED)**  
    Baltimore Gas and Electric (NEW in 2016!)  
    ComEd Energy Delivery  
    PECO Energy Delivery  
**FirstEnergy Corporation**  
    Allegheny Power  
**Fort Pierce Utilities Authority**  
**Grand Island Utilities Department**  
**Green Mountain Power**  
**Hastings Utilities**  
**ITC Transmission**  
**Kings River Conservation District**  
**Los Angeles Dept. of Water and Power**  
**Louisville Gas and Electric Company (LG&E)**  
    and **Kentucky Utilities Company (KU)**  
**Lower Colorado River Authority (LCRA)**  
**Manitowoc Public Utilities**  
**Memphis Light, Gas & Water Division**  
**Menasha Electric and Water Utilities**  
**MidAmerican Energy**  
**Montana-Dakota Utilities**  
**Muscatine Power & Water**  
**Nashville Electric Service (NES)**

# Partners (continued)

## **National Grid**

Granite State Electric  
Massachusetts Electric  
Nantucket Electric  
Narragansett Electric  
New England Electric Transmission Corporation  
New England Hydro-Transmissions Company Inc.  
New England Power Company  
Niagara Mohawk Power Corporation

## **Nebraska Public Power District**

**New Hampshire Transmission-Seabrook  
Station**

## **New York Power Authority**

**New York State Electric and Gas**

## **Northeast Utilities Services Company**

Connecticut Light and Power Company  
Public Service Company of New Hampshire  
Western Massachusetts Electric Company

## **Northern Indiana Public Service Company (NIPSC)**

## **Oglethorpe Power**

**Oklahoma Gas and Electric Corporation**

**Oncor (formerly TXU)**

## **Otter Tail Power Company**

## **Pacificorp**

Pacific Power  
Rocky Mountain Power

## **Pacific Gas and Electric Corporation (PG&E)**

**PNM Resources**

**Public Utility District (PUD) No. 1 of Douglas  
County**

**PUD No. 1 of Pend Oreille County**

**Rochester Gas and Electric Corporation**

**Sacramento Municipal Utility District (NEW in  
2016!)**

**Salt River Project**

**San Diego Gas & Electric**

**Seattle City Light**

**Silicon Valley Power**

**South Carolina Electric & Gas Company**

**Southern Company**

**Tennessee Valley Authority (TVA)**

**Texas Municipal Power Agency**

**Vermont Electric Cooperative**

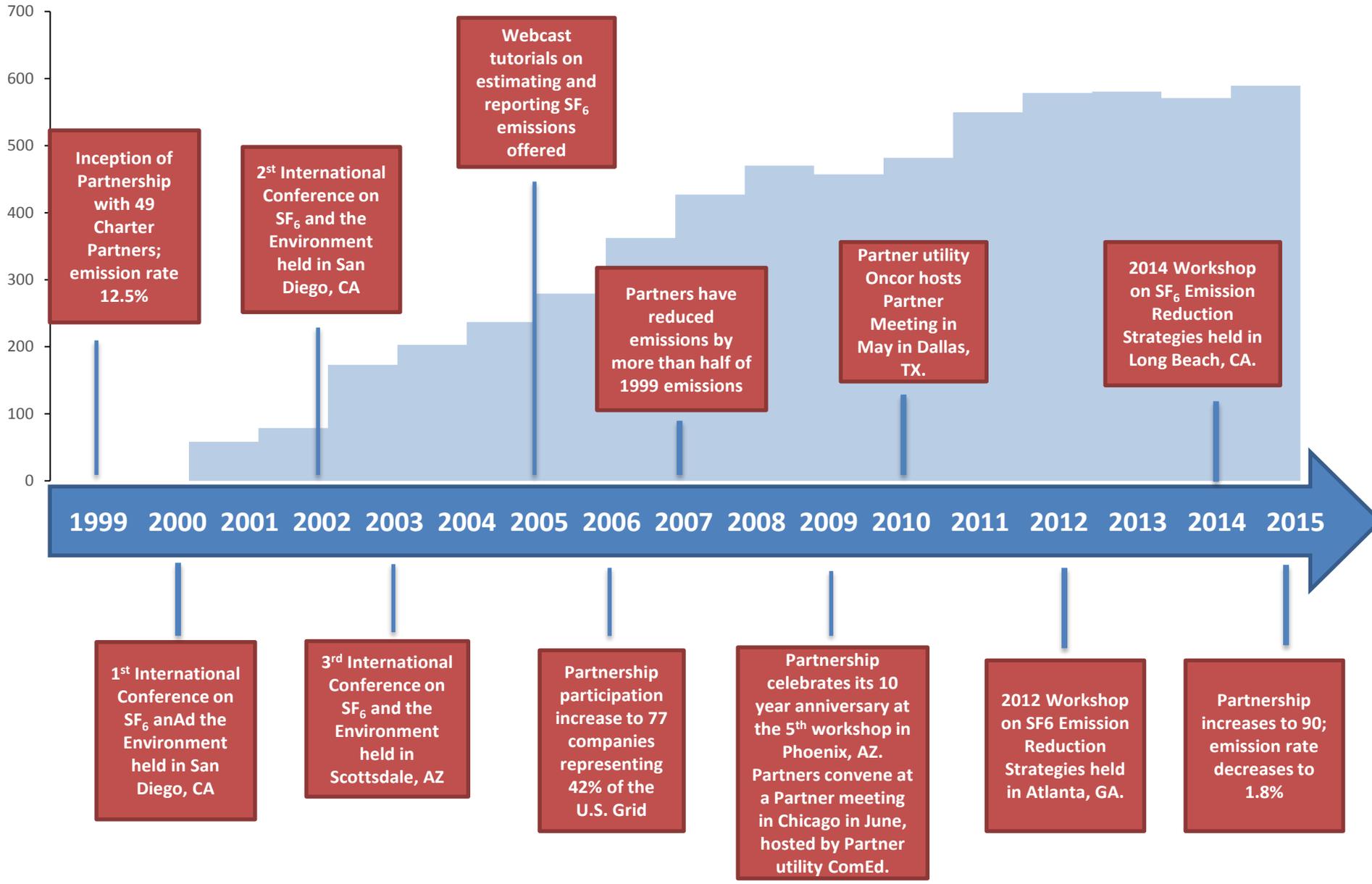
**VT Transco LLC**

**Wallingford Electric Division**

**We Energies**

**Westar**

# SF<sub>6</sub> Partnership Timeline and Annual SF<sub>6</sub> Reductions relative to 1999 (thousand lbs SF<sub>6</sub>)



# Partnership Accomplishments

- 76 percent decrease in SF<sub>6</sub> emissions of Partners since 1999
- *Cumulative* reductions of 6.1 million pounds of SF<sub>6</sub> (compared to holding 1999 levels constant)
  - Equivalent to removing 13.2 million passenger cars off the roads for one year
- 85 percent decrease in emissions rate (emissions/nameplate capacity) since inception

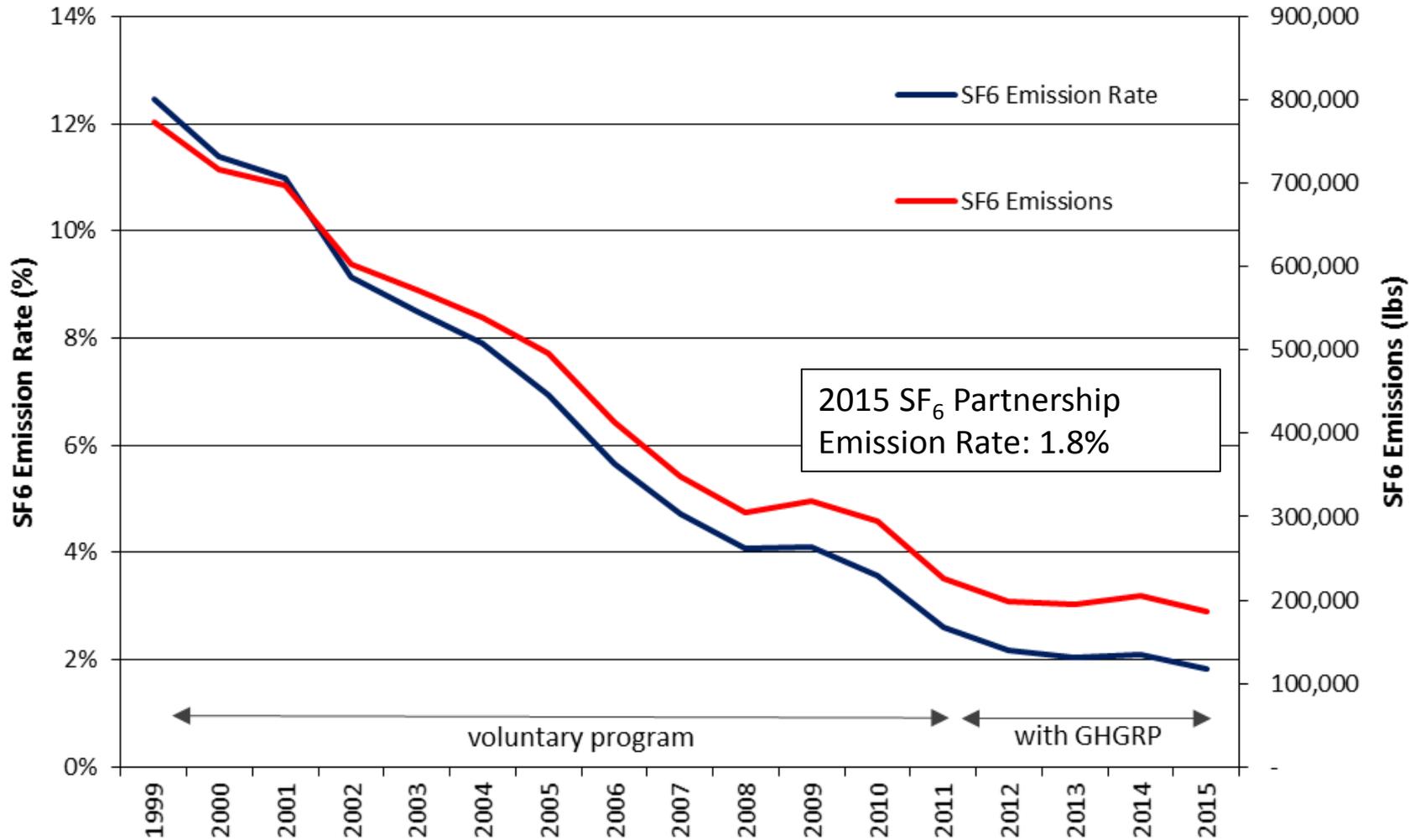
Summary of Absolute Partnership SF<sub>6</sub> Emission Reductions

|  | 1999    | 2005    | 2006    | 2007    | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>Total Partner-Reported SF<sub>6</sub> Emission (lbs)</b>                | 773,190 | 496,667 | 413,646 | 348,980 | 305,622 | 318,855 | 294,119 | 226,159 | 197,530 | 195,369 | 205,009 | 186,560 |
| <b>Total Partner-Reported SF<sub>6</sub> Emission (MMTCO<sub>2</sub>e)</b> | 8.00    | 5.14    | 4.28    | 3.61    | 3.16    | 3.30    | 3.04    | 2.34    | 2.04    | 2.02    | 2.12    | 1.93    |
| <b>Reduction from 1999 (lbs)</b>   |         | 276,523 | 359,544 | 424,210 | 467,568 | 454,335 | 479,071 | 547,031 | 575,660 | 577,821 | 568,181 | 586,630 |
| <b>Reduction from 1999 (MMTCO<sub>2</sub>e)</b>                            |         | 2.86    | 3.72    | 4.39    | 4.84    | 4.70    | 4.95    | 5.66    | 5.95    | 5.98    | 5.88    | 6.07    |
| <b>Percent Reduction from 1999</b>   |         | 36%     | 47%     | 55%     | 60%     | 59%     | 62%     | 71%     | 74%     | 75%     | 73%     | 76%     |

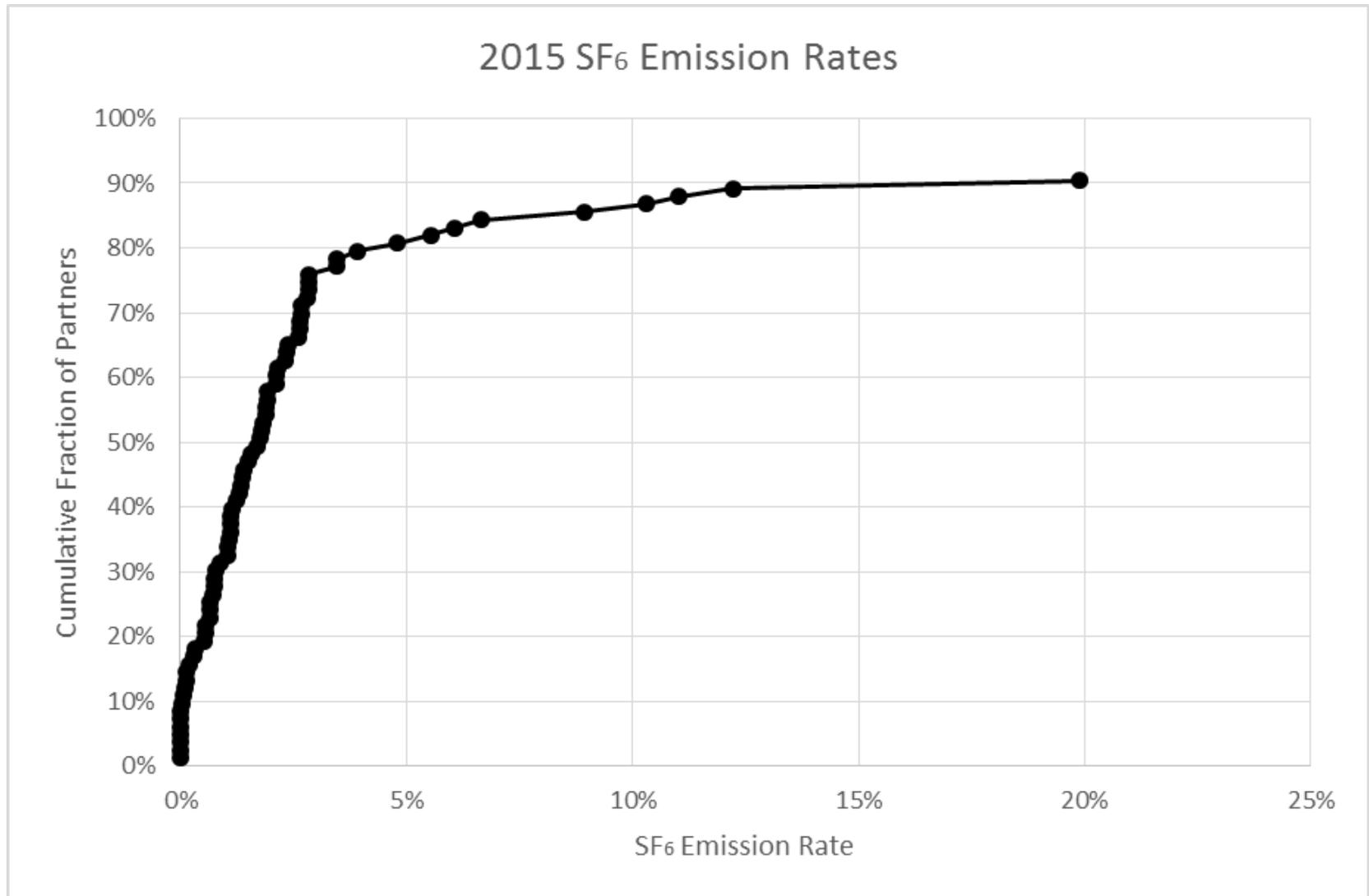
Note: Historical estimates have been updated based on the estimation methodology used by EPA and data made available by Partners.

# Partner Accomplishments

## SF<sub>6</sub> Emissions and Emission Rates



# Partnership SF<sub>6</sub> Emission Rates, 2015



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Thank you.

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