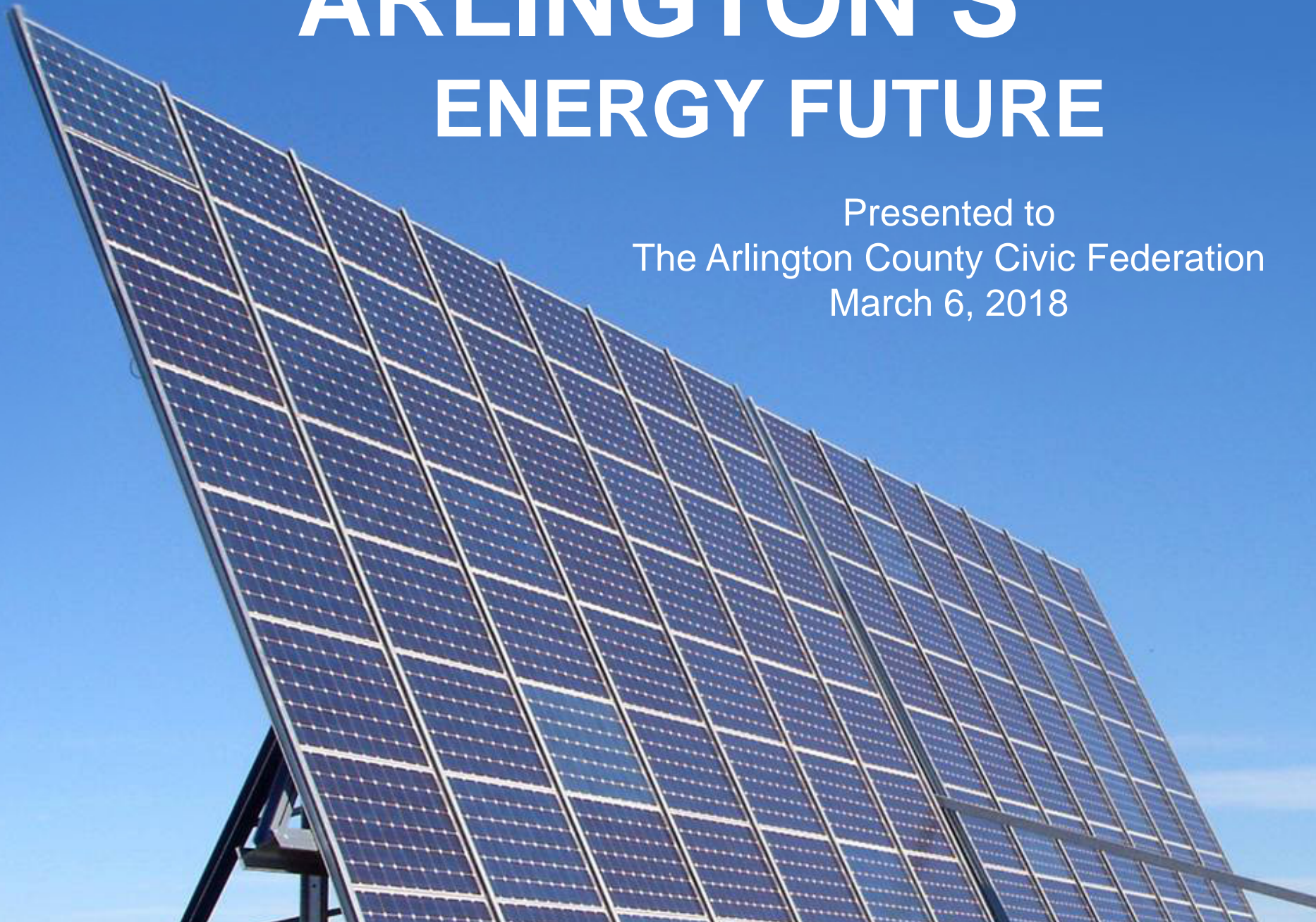


ARLINGTON'S ENERGY FUTURE

Presented to
The Arlington County Civic Federation
March 6, 2018

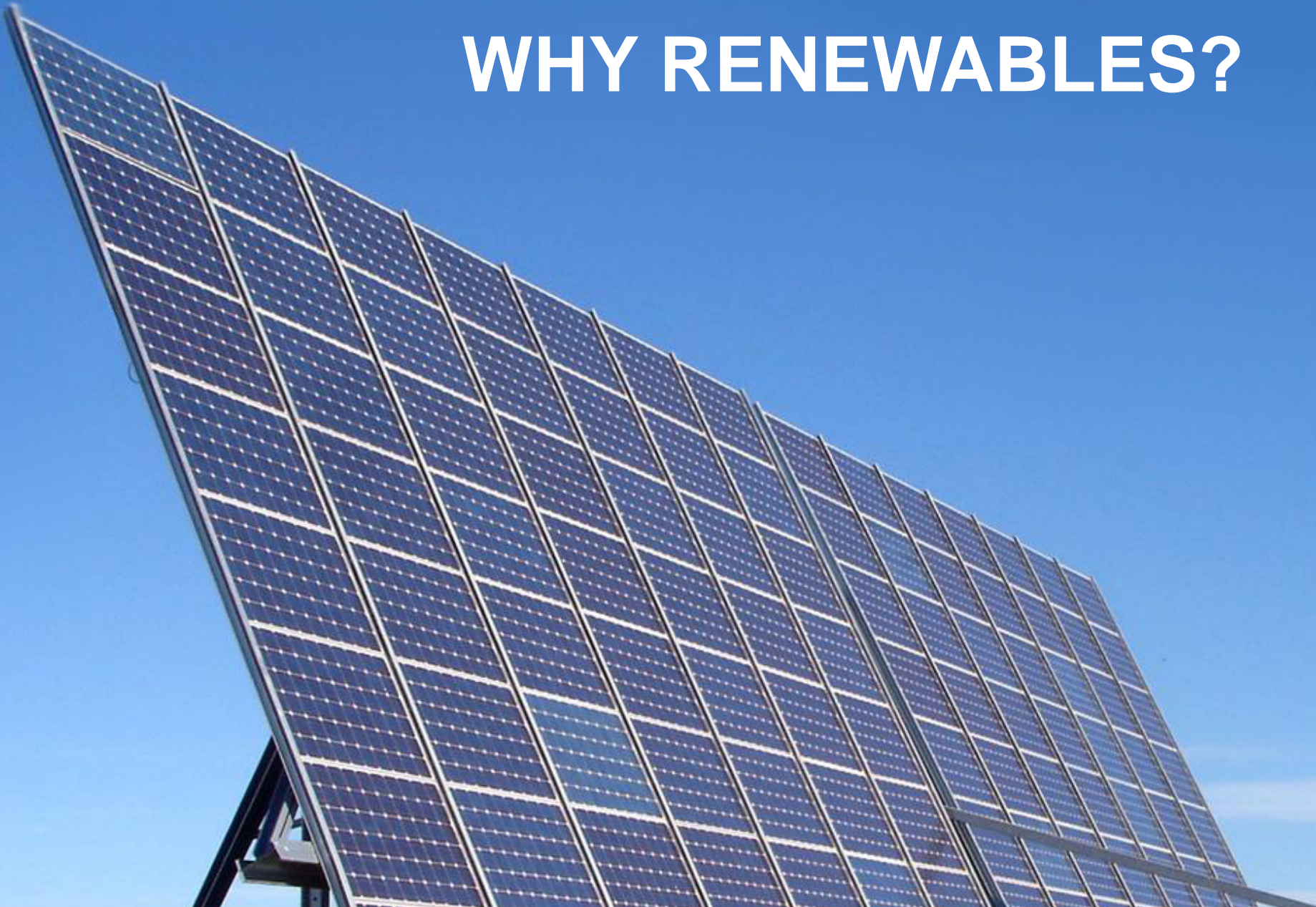


ARLINGTON'S ENERGY FUTURE

Overview

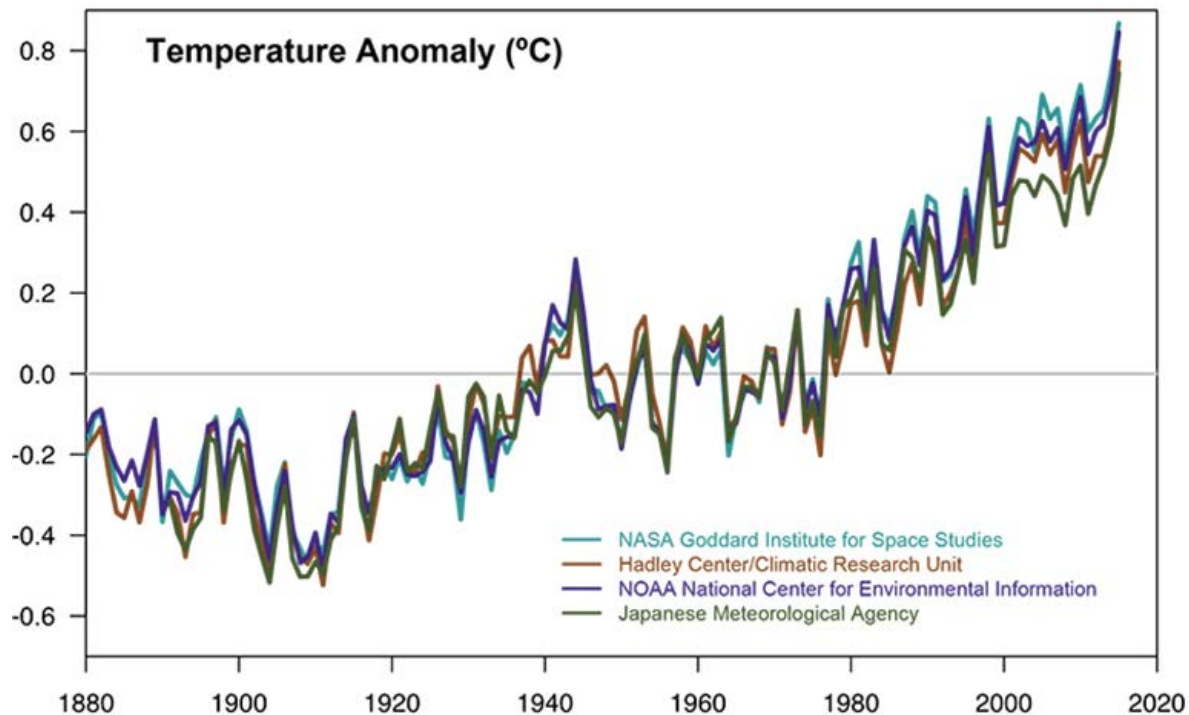
1. Why renewables?
2. Electricity use in Arlington
3. How Arlington can achieve 100% renewable electricity by 2035
4. Discussion

WHY RENEWABLES?



WHY RENEWABLES?

- Necessity:** There is overwhelming scientific consensus that we must transition to renewable energy as soon as possible

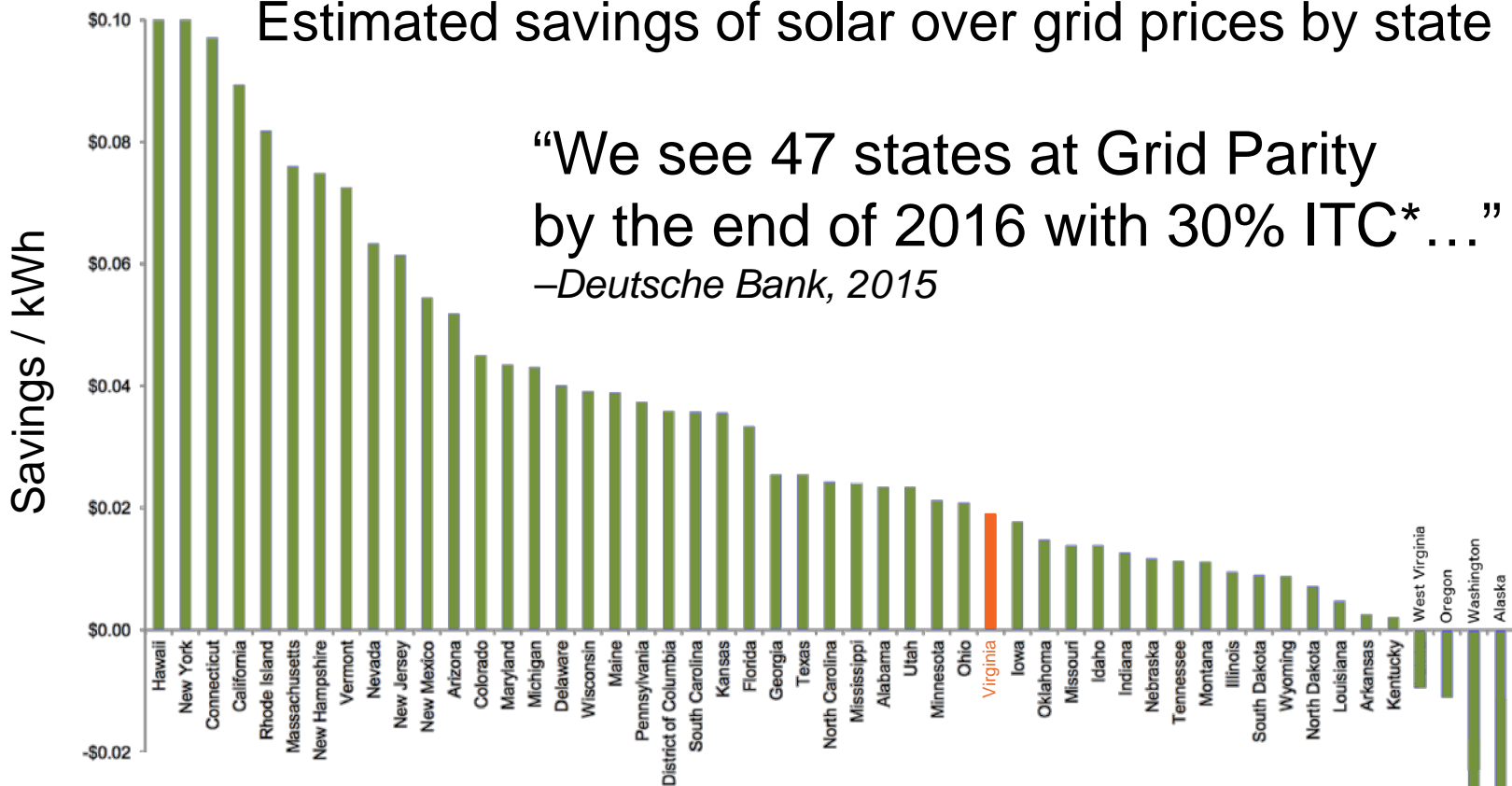


From NASA's Global Climate Change website (climate.nasa.gov/scientific-consensus)

WHY RENEWABLES?

2. Economics: Solar and wind grid parity is here

Estimated savings of solar over grid prices by state



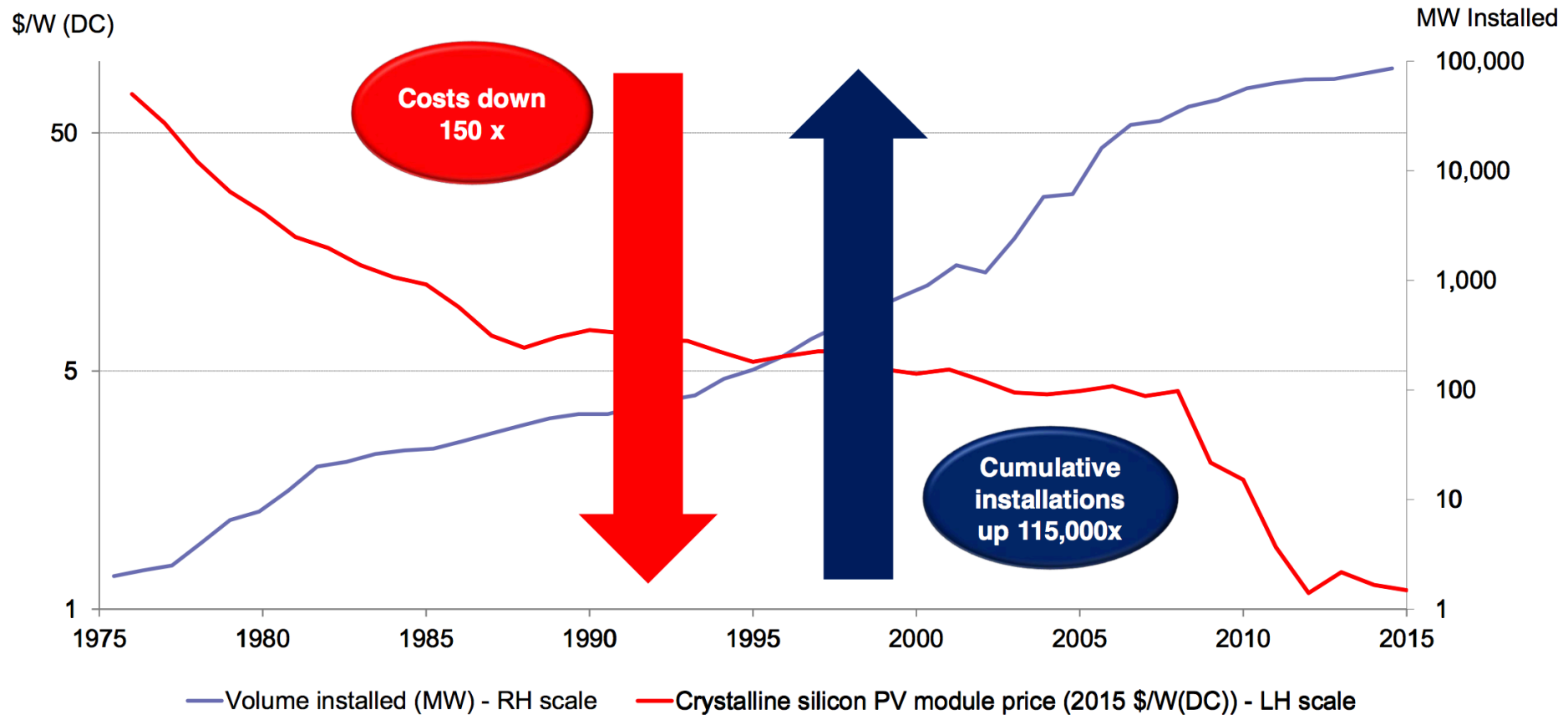
*“ITC” refers to the U.S. Investment Tax Credit, which is set at 30% until a phase-out begins in 2020.

Deutsche Bank Securities, Inc., *Solar Grid Parity in a Low Oil Price Era*, February 2015, available online at

https://db.com/cr/en/docs/solar_report_full_length.pdf

WHY RENEWABLES?

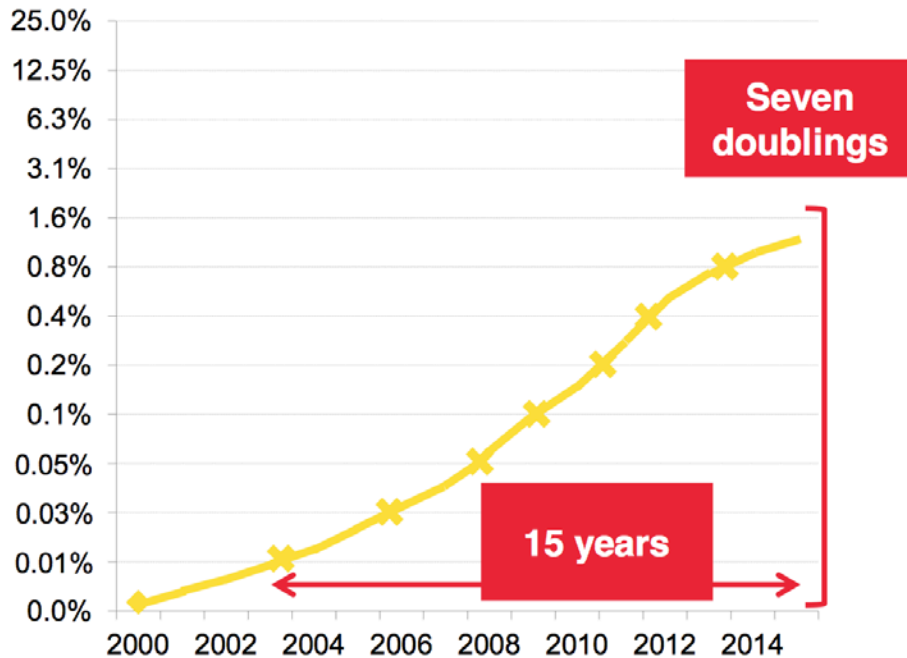
Solar costs are falling fast



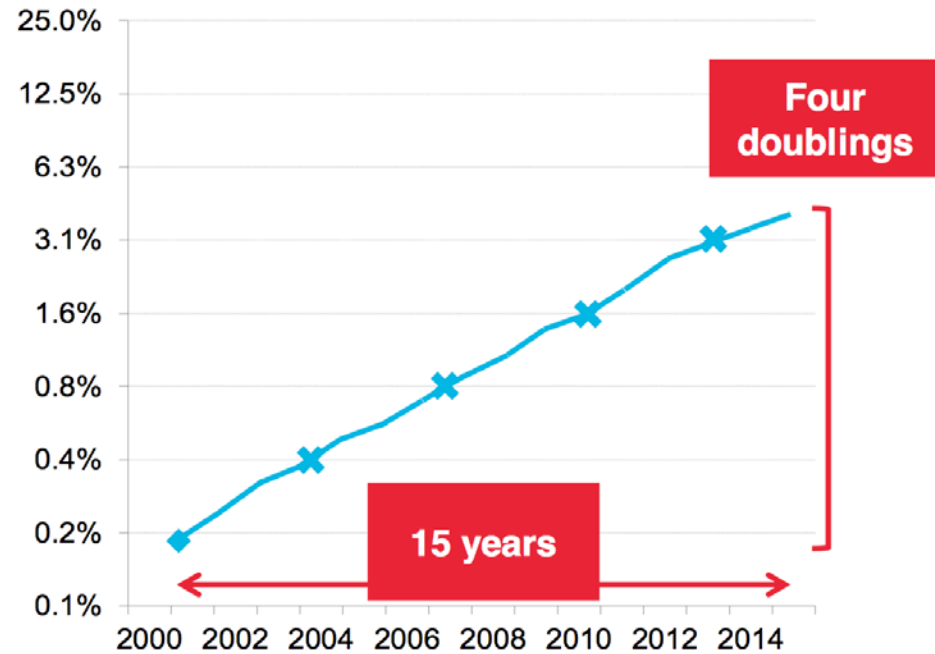
WHY RENEWABLES?

Solar and wind are growing exponentially

SOLAR



WIND

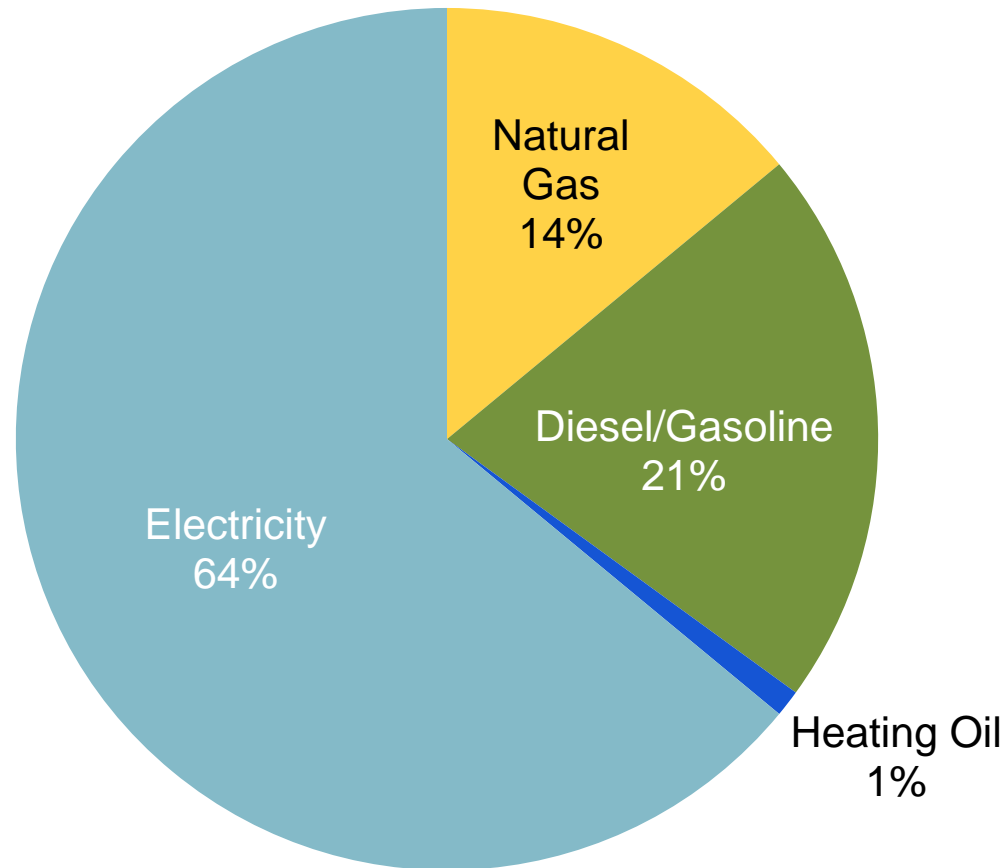


A large array of solar panels is shown from a low angle, tilted upwards against a clear blue sky. The panels are arranged in a grid pattern, with each panel containing a grid of small solar cells. The perspective is from the bottom left, looking up and across the array towards the top right.

ELECTRICITY USE IN ARLINGTON

ELECTRICITY USE IN ARLINGTON

Electricity use is about two-thirds of Arlington's total energy use

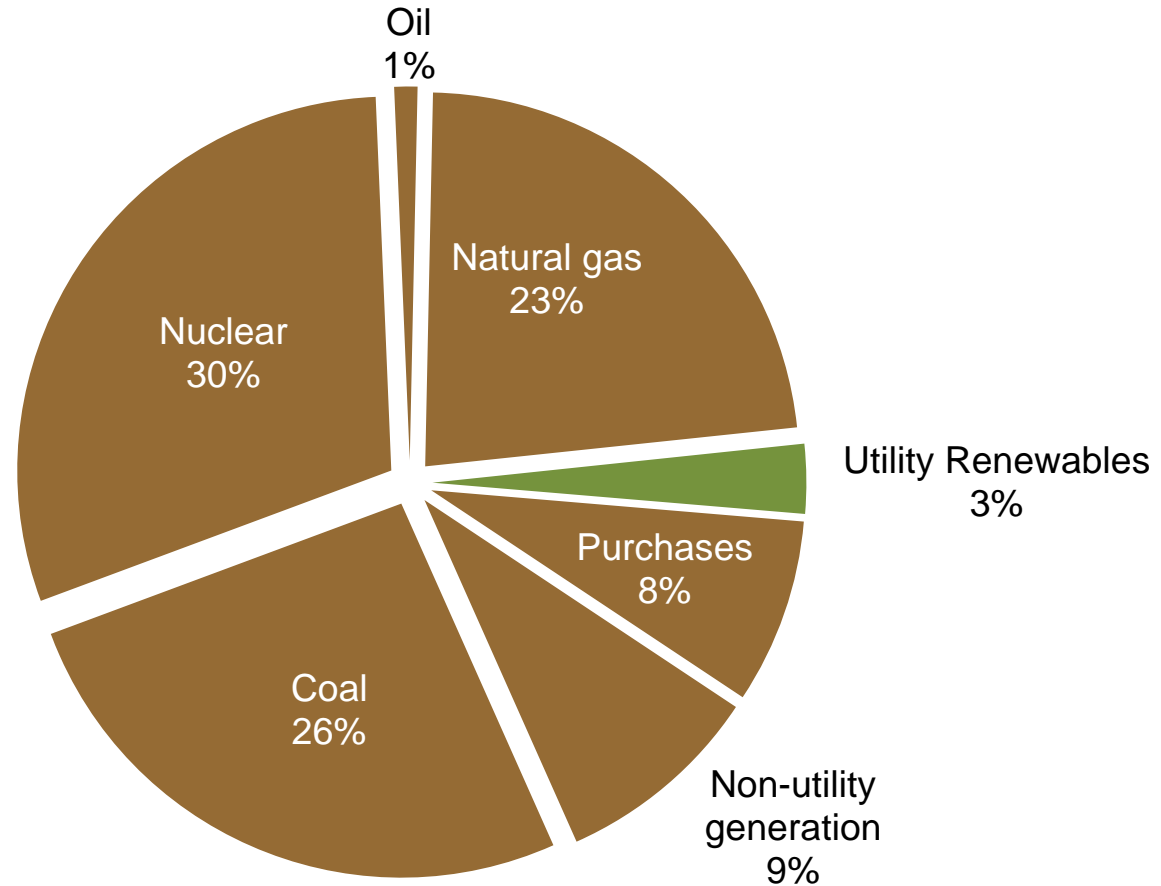


Arlington County Community Energy Plan, p. 6 (2007 data)

<https://environment.arlingtonva.us/energy/community-energy-plan-cep/>

ELECTRICITY USE IN ARLINGTON

Dominion supplies Arlington's electricity from these sources:

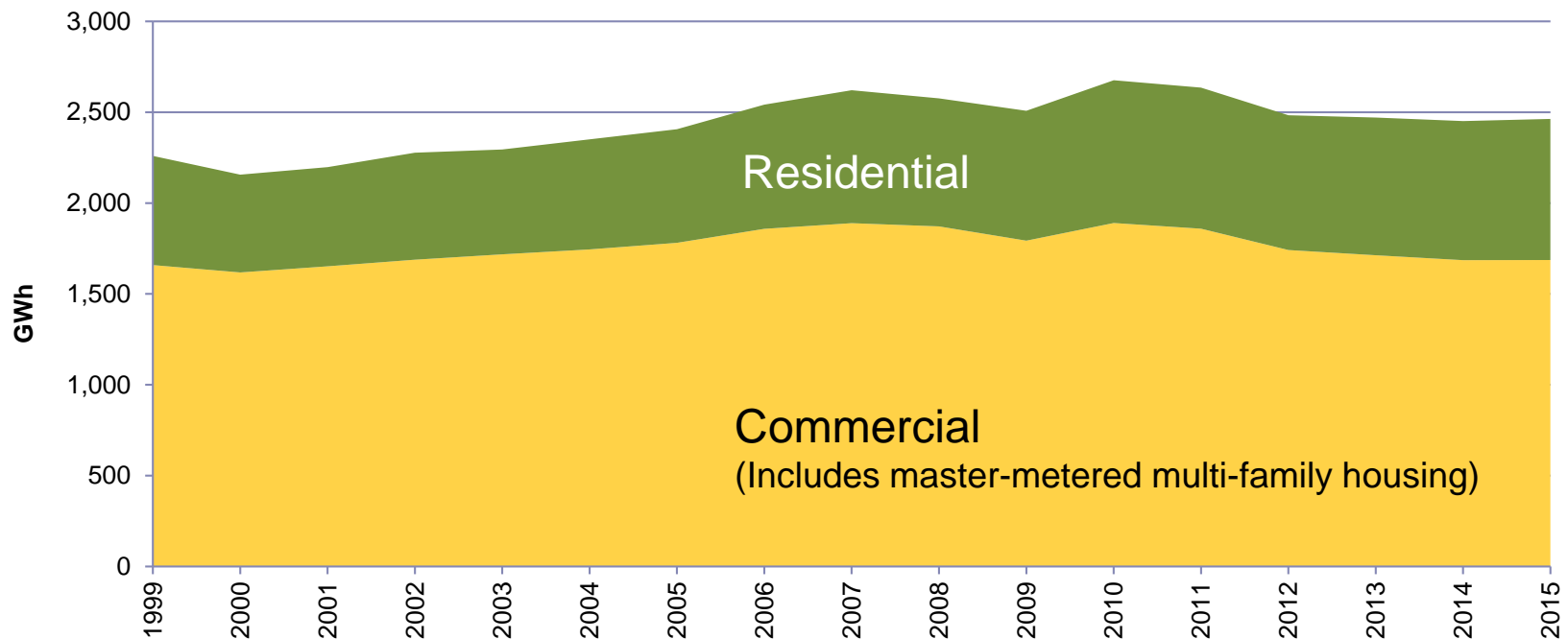


2015 Energy mix

Dominion Integrated Resource Plan (2016) at 37, available online at <http://dom.com/library/domcom/pdfs/electric-generation/2016-irp.pdf>

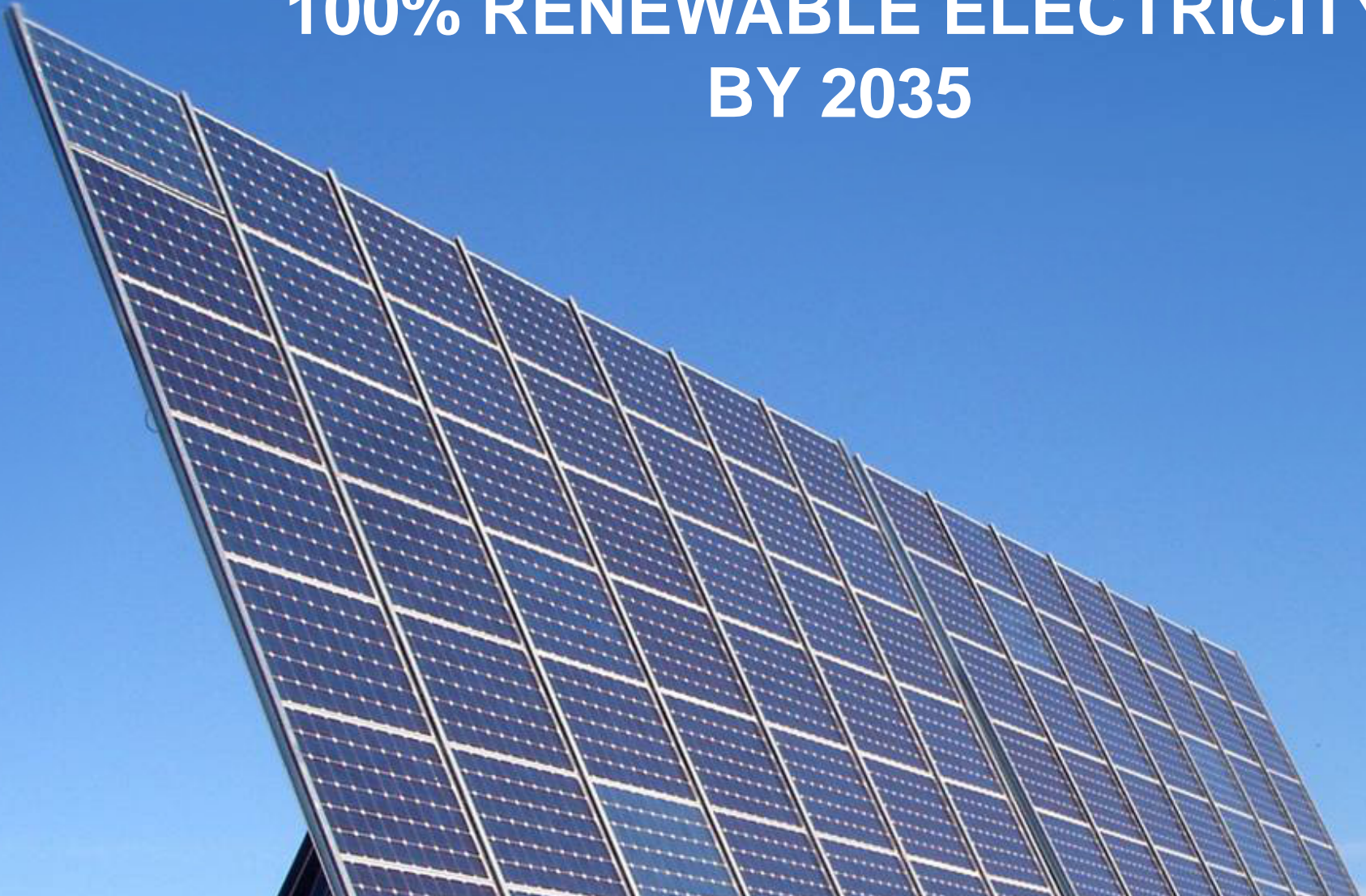
ELECTRICITY USE IN ARLINGTON

The commercial sector uses about twice as much electricity as the residential sector in Arlington. Despite population growth, energy use has declined since 2010.



Data from Arlington County, "Utility accounts & usage", available online at <https://data.arlingtonva.us/dataviews/231353/UTILI-ACCOU-USAGE/>

HOW ARLINGTON CAN ACHIEVE 100% RENEWABLE ELECTRICITY BY 2035



HOW ARLINGTON CAN ACHIEVE 100% RE

Renewable electricity means:

Electricity that is naturally produced using sustainable sources that are not exhausted by their use in energy production.*

100% means:

Arlington County will generate or purchase** renewable electricity in an amount equal to or greater than 100% of usage. Any non-renewable electricity still supplied to Arlington via the grid must be offset*** by renewable electricity added to the grid.

* This includes wind, solar, hydro, tidal, and geothermal.

** In the case of renewable energy certificates (RECs) only the renewable attribute of the electricity is purchased.

*** Currently available mechanisms to accomplish offsets include rooftop solar, PPAs, VPPAs, “green tariffs,” “community solar” and renewable energy certificates (RECs).

HOW ARLINGTON CAN ACHIEVE 100% RE

Large Scale Solar and Wind Are Key

- Large scale solar is now the least expensive option for new generation in Virginia, according to Dominion
- New legislation approves **5 Gigawatts** of wind and solar by 2028
- Dominion has right to develop at least **2 Gigawatts** of offshore wind
- Outlook keeps improving

HOW ARLINGTON CAN ACHIEVE 100% RE

Core questions in assessment and planning:

1. How much electricity will we need in 2035?

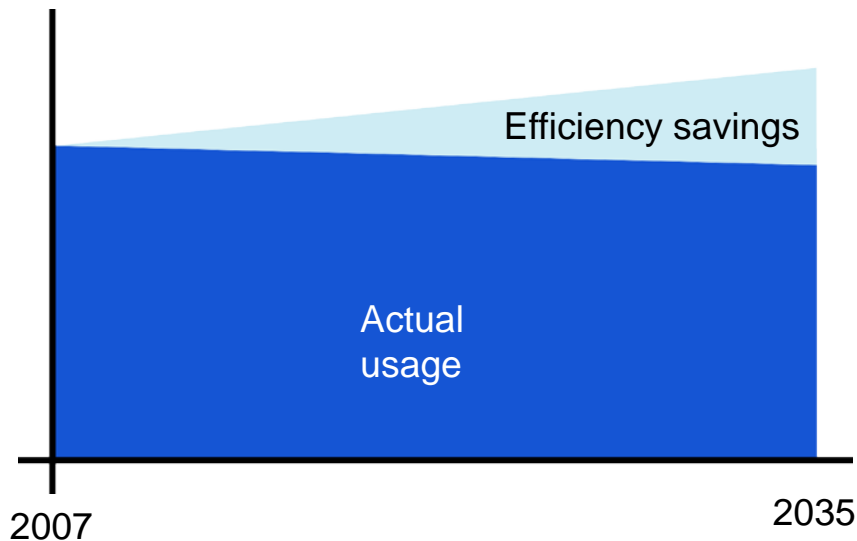
Current demand + growth - efficiency gains

2. Where will it come from?

Dominion + local RE + external RE + RECs

HOW ARLINGTON CAN ACHIEVE 100% RE

How much electricity will Arlington need in 2035?



2.62 TWh = Actual 2007 use
(commercial and residential)

2.5 TWh = Estimated 2035
use

Rationale:

1. Estimated population growth 2007–2035 = 33.7%

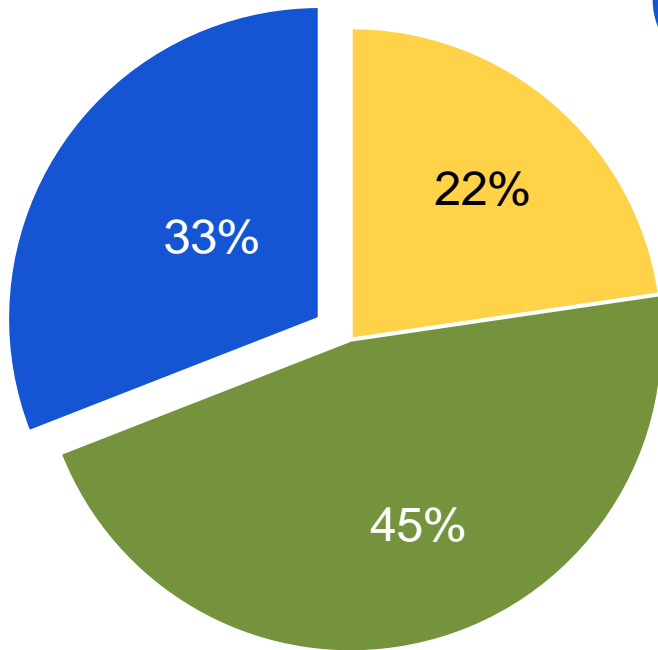
Source: <https://projects.arlingtonva.us/data-research/future-data-forecasts>

2. Estimated efficiency gain 2007–2035 = 30%

Source: CEP calls for all buildings to be 25% more efficient than 2007 by 2030; 2030–2035 efficiency gains estimated at 1% per year

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?



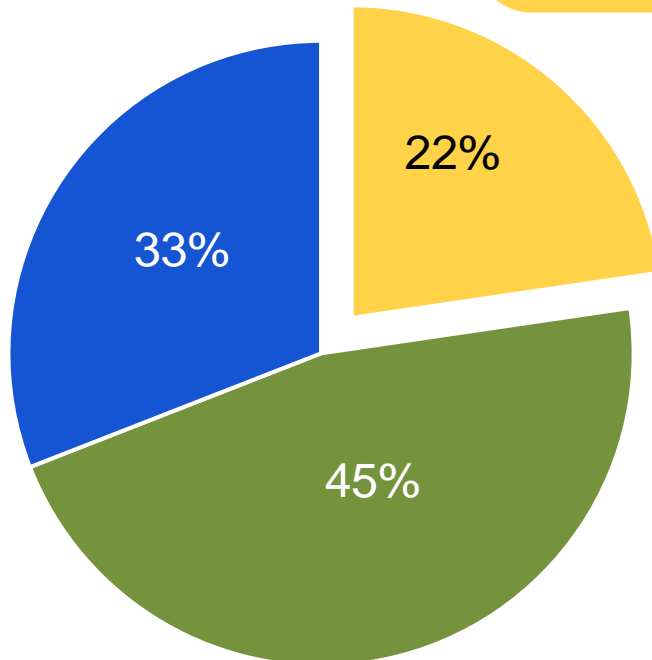
Dominion: 33% or more

- Based on Dominion's commitment to voluntary RPS, IRP identification of solar as least cost resource, impact of ED11, and offshore wind timeline
- Market forces and policy changes will determine whether Dominion meets or exceeds this estimate

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?

Local solar power: 22%



- Current rooftop potential = 500 MW,* or 25% of what is needed**
- Projected gains in panel efficiency, available rooftops, and cost will increase potential to about 67% of what is needed
- Achieving 33% of that potential by 2035 = 22% of the total amount needed
- Means converting just over 1% of electricity use to “local solar” each year on average, with greater amounts installed in later years

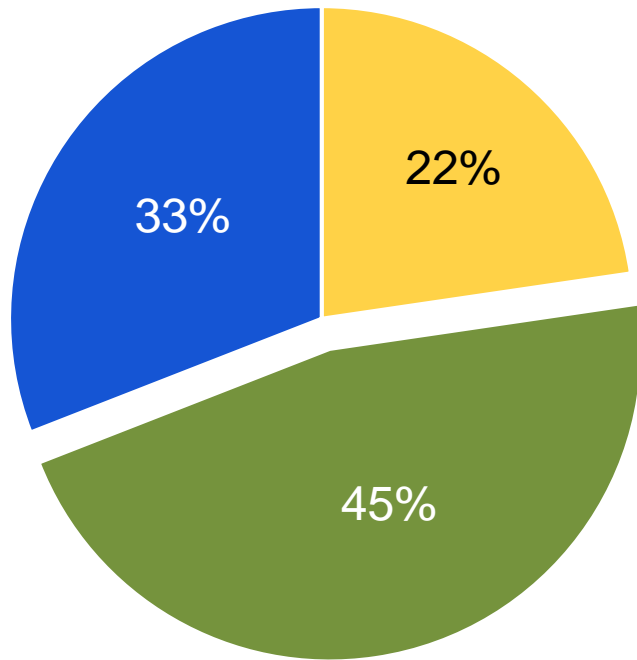
* Total rooftop potential as measured by the Northern Virginia Regional Commission’s Solar Map, available online at <http://www.novasolarmap.com>; estimate of 494.731 MW provided by NVRC staff, September, 2016.

** Annual generation potential per installed MW estimated at 1,246 MWh/year. This is the rate used for small buildings in Virginia by the National Renewable Energy Laboratory (NREL), “Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment,” available online at <http://nrel.gov/docs/fy16osti/65298.pdf>, Table 3 (p. 26-27).

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?

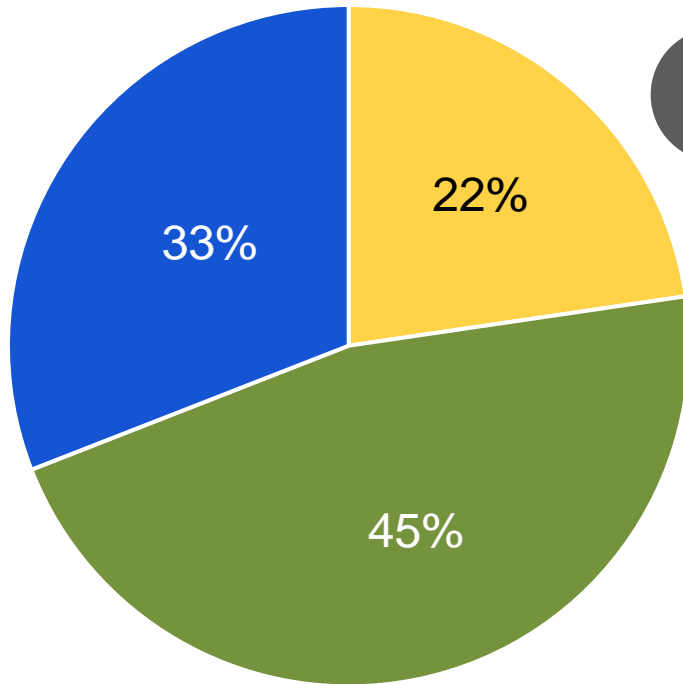
Renewable energy
purchased outside Arlington: 45%



- PPAs, VPPAs, Green Tariffs, etc., will enable all sectors to buy utility-scale renewable power from outside Arlington
- Rapid decline in renewable prices makes these options affordable

HOW ARLINGTON CAN ACHIEVE 100% RE

Where can we get 2.5 TWh of renewable electricity in 2035?



Renewable Energy Certificates

RECs are an acceptable way to temporarily address unanticipated shortfalls in Arlington's plan*

*For an overview of PPA's, VPPAs and RECs, see <http://www.energysmart.enernoc.com/a-practical-guide-to-renewable-energy-terms-what-are-ppas-virtual-ppas-and-recs/>

WHY COMMIT TO 100% RE?

1. It will help Arlington achieve its CEP goals
2. It will reduce the negative impact of pollution on health, climate change, water and air resources
3. It will enhance Arlington's energy security and resilience
4. It will reinforce Arlington's role as an energy policy leader
5. It will send a powerful message about the desire for renewable electricity in Virginia

RENEWABLE CITIES

- 62 U.S. cities and counties are committed to 100% renewable electricity
- 5 already 100% RE
- 7,477 jurisdictions worldwide (including Arlington County) have committed to climate leadership by joining the Global Covenant of Mayors for Climate and Energy

Rock Port, MO
Greensburg, KS
Kodiak Island, AK
Aspen, CO
Burlington, VT
Abita Springs, LA
Amherst, MA
Angel Fire, NM
Atlanta, GA
Boulder, CO
Breckenridge, CO
Cambridge, MA
Chula Vista, CA
Columbia, SC
Del Mar, CA
Denton, TX
Downingtown, PA
Eagle Nest, NM
East Hampton, NY
Edmonds, WA
Encinitas, CA
Fayetteville, AR
Georgetown, TX
Goletta, CA
Hanover, NH
Hillsborough, NC
Lafayette, CO
Longmont, CO
Madison, WI
Menlo Park, CA
Moab, UT

Monterey, CA
Multnomah County, OR
Nederland, CO
Nevada City, CA
Orlando, FL
Palo Alto, CA
Park City, UT
Phoenixville, PA
Portland, OR
Pueblo, CO
Questa, NM
Red River, NM
Salt Lake City, UT
San Diego, CA
San Francisco, CA
San Jose, CA
Santa Barbara, CA
Sarasota, FL
Solana Beach, CA
South Lake Tahoe, CA
Southampton, NY
St. Louis, MO
St. Louis Park, MO
St. Petersburg, FL
Summit County, CO
Summit County, UT
Taos, NM
Taos County, NM
Taos Ski Valley, NM
Truckee, CA
West Chester, PA

THANK YOU!