STRATEGIES TO IMPROVE AIR QUALITY IN NORTH TEXAS

VEHICLES & ENERGY

Energy Center Workshop

April 28, 2016

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North Central Texas Council of Governments

OVERVIEW & AGENDA

1. Air Quality in the NCTCOG Region
2. Importance of Air Quality
3. Solar
4. Electric Vehicles
5. The Solar/ EV connection

CLEAN AIR ACT

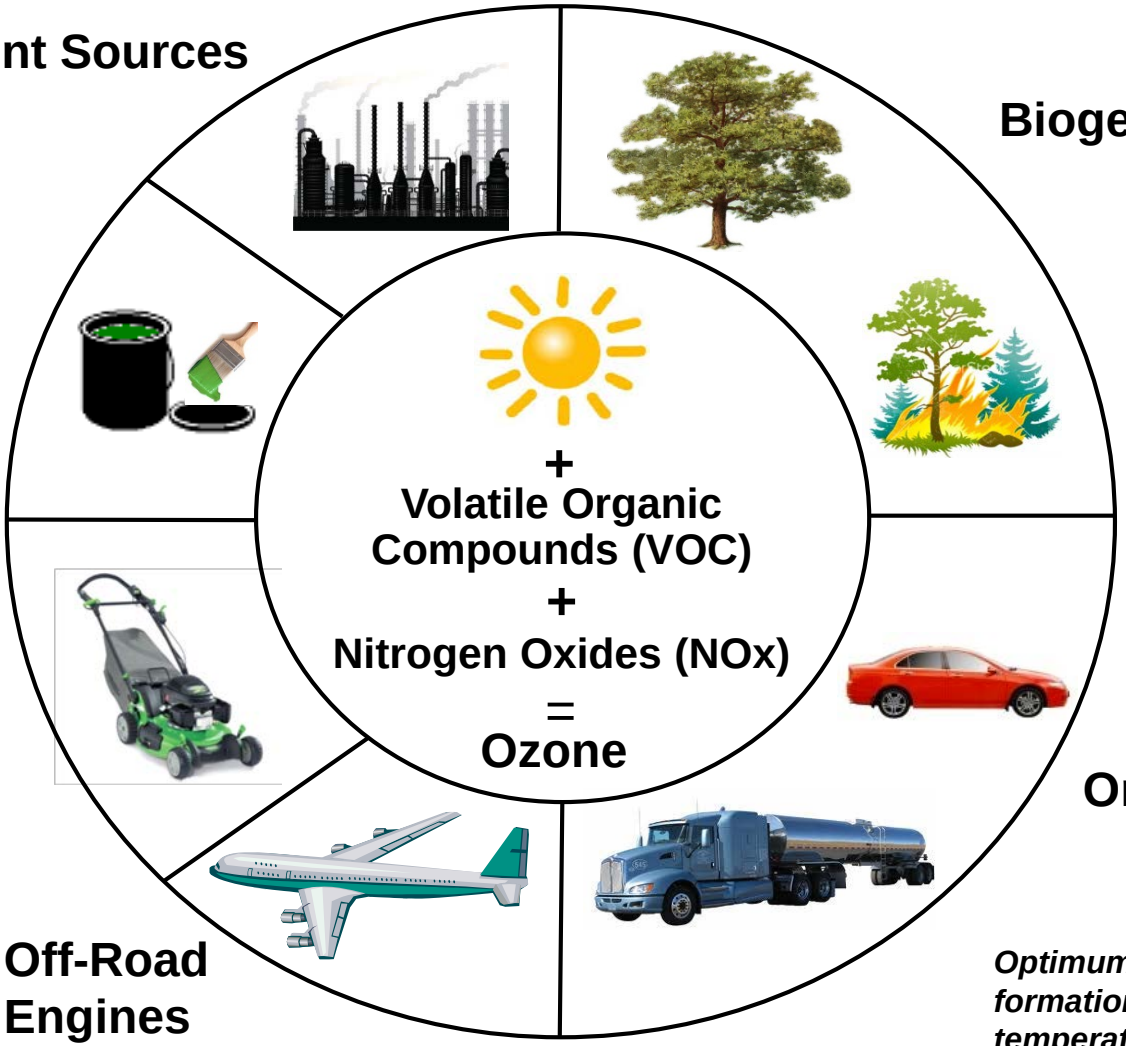
Clean Air Act (CAA) last amended in 1990

Requires Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants:

- **Carbon Monoxide (CO)**
- **Lead (Pb)**
- **Nitrogen Oxides (NO_X)**
- **Ozone (O_3)**
- **Particulate Matter (PM)**
- **Sulfur Dioxide (SO_2)**

EPA must complete a review of NAAQS every 5 years

OZONE FORMATION

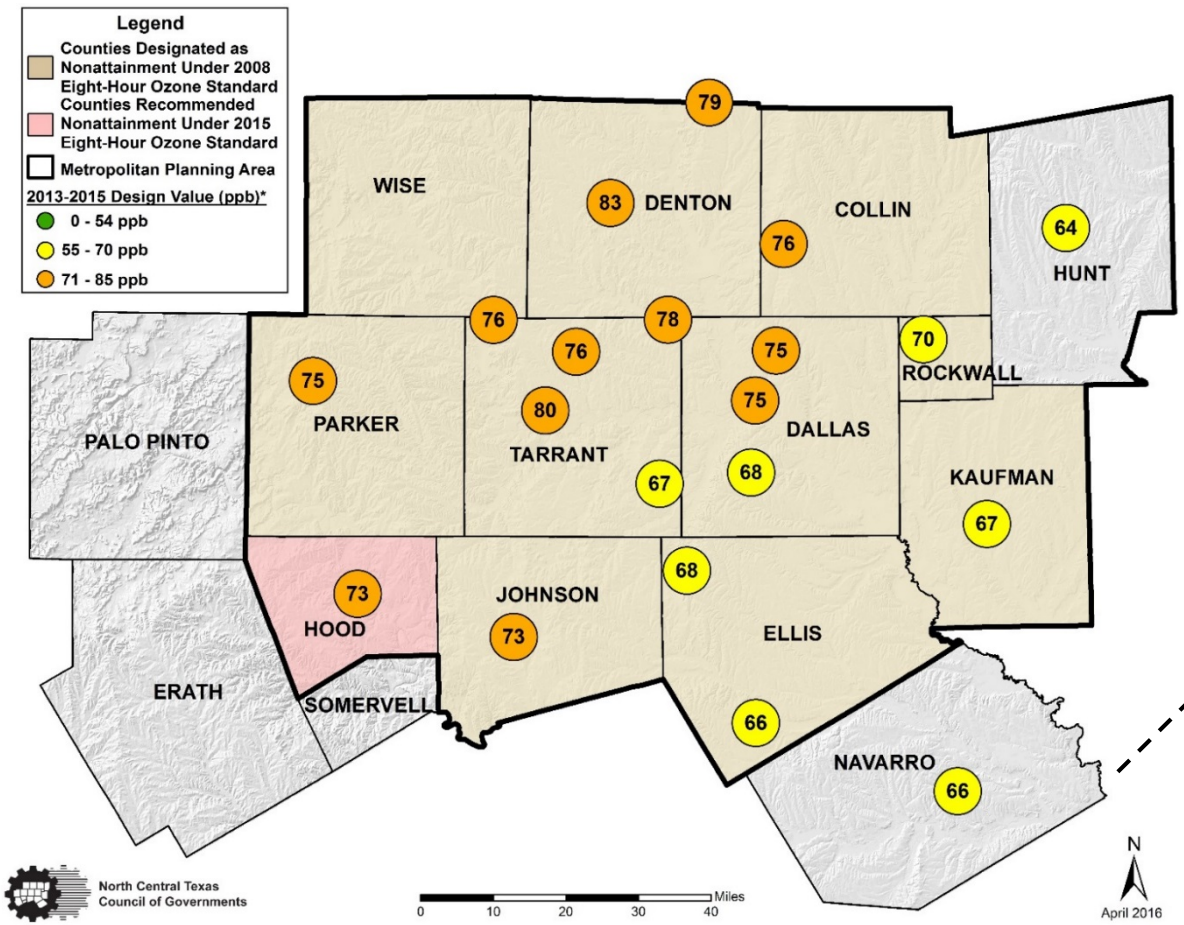


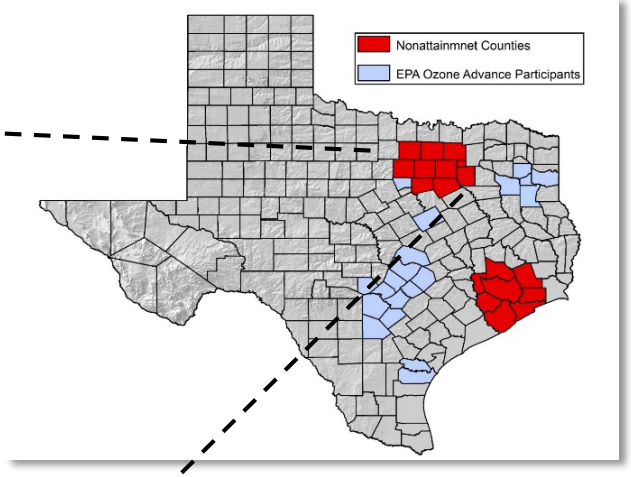
Optimum conditions for the formation of ozone include high temperatures and low winds.

WHY DOES THIS MATTER?

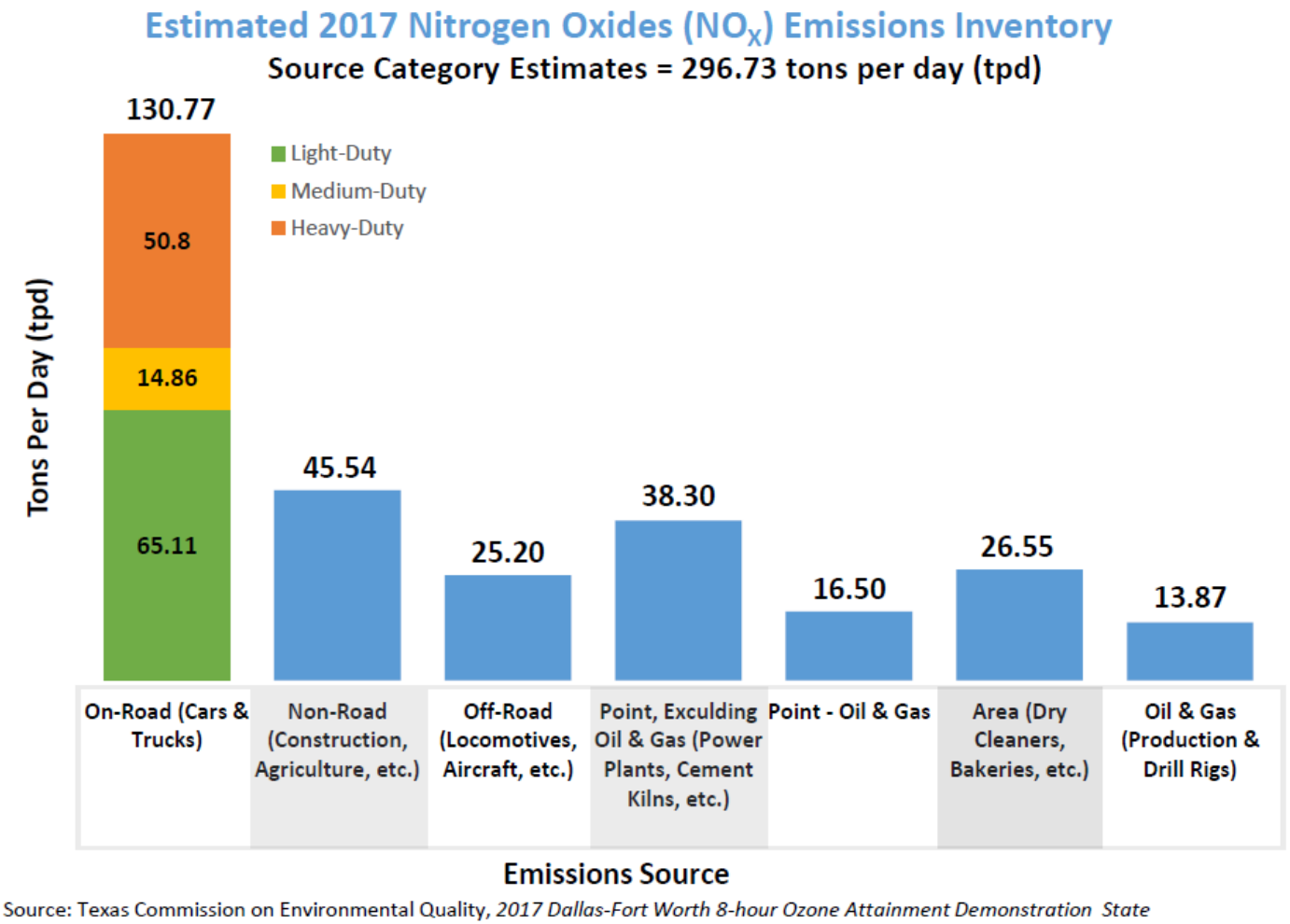
Air Quality Index (AQI) Values	Eight-Hour Ozone Levels (≤70 ppb)	Levels of Health Concern
0 to 50	0-54	Good
51-100	55-70	Moderate
101-150	71-85	Unhealthy for Sensitive Groups
151-200	86-105	Unhealthy
201-300	106-200	Very Unhealthy
301 – 500+	Not Defined	Hazardous

TEXAS NONATTAINMENT AREAS



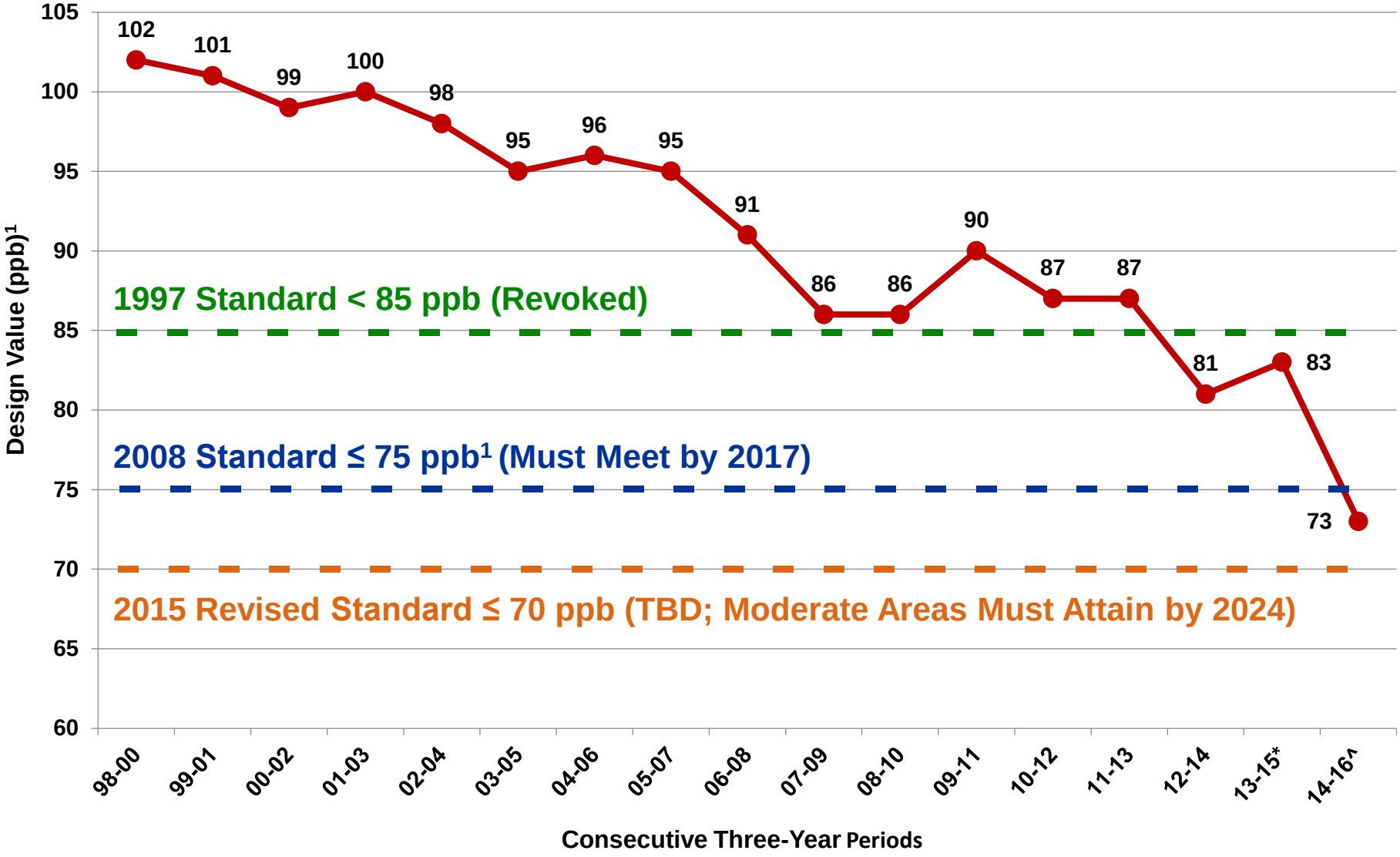


LOCAL NO_X EMISSION SOURCES



Source: Texas Commission on Environmental Quality, *2017 Dallas-Fort Worth 8-hour Ozone Attainment Demonstration State*

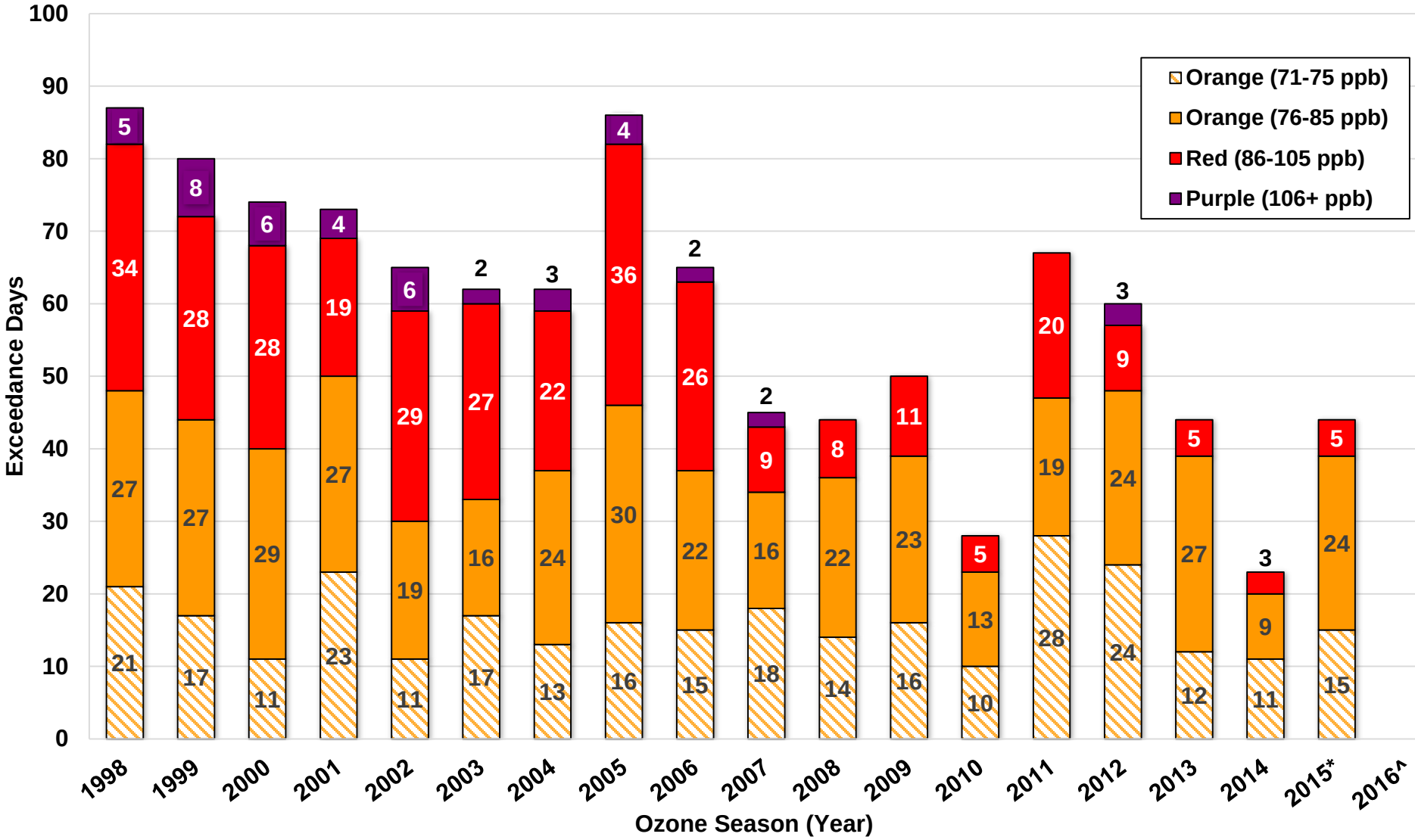
OZONE TREND LINE



[1]Attainment Goal - According to the US EPA National Ambient Air Quality Standards, attainment is reached when, at each monitor, the *Design Value* (three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration) is equal to or less than 70 ppb.
*Data not certified by the Texas Commission on Environmental Quality
^Not a full year of data, current as of 4/05/2016.

Source: NCTCOG TR Dept

EIGHT-HOUR OZONE EXCEEDANCE DAYS



Exceedance Level indicates daily maximum eight-hour average ozone concentration. Exceedance Levels are based on Air Quality Index (AQI) thresholds established by the EPA for the for the revised ozone standard of 70 parts per billion (ppb).

= Additional level orange exceedance days under the revised standard that were not exceedances under the previous 75 ppb standard. (AQI level orange = 71-75 ppb)

* Data not certified by the TCEQ
^Not a full year of data, current as of 4/05/2016
Source: TCEQ, http://www.tceq.state.tx.us/cgi-bin/compliance/monops/8hr_monthly.pl

SAMPLE OF ON-ROAD INITIATIVES

Clean Cities
U.S. Department of Energy

Dallas-Fort Worth CLEAN CITIES

air northtexas
be air aware

try parking it
Rideshare. Record. Reward.

Bike/Walk North Texas

LOOKOUT TEXANS
BIKE
WALK
DRIVE
SAFELY

evnt
Electric Vehicles North Texas

AirCheckTexas

Drive a Clean Machine

Regional Emissions Enforcement Program

SMARTE
Saving Money and Reducing Truck Emissions

RSVP
REGIONAL SMOKING VEHICLE PROGRAM
Don't Choke, Call #SMOKE

NED

Proud Supporter of SmartWay®

Be Car Care Aware®

SAMPLE OF NON-ROAD INITIATIVES

GO SOLAR North Texas

Vision North Texas
Understanding Our Options for Growth

TimeToRecycle.com

THE GREAT UPDATE REBATE

DALLAS 2030 DISTRICT®

EPA United States Environmental Protection Agency
RE-Powering Mapping and Screening

nctsf
north central texas stewardship forum

SECO
State Energy Conservation Office

TERP
TEXAS EMISSIONS REDUCTION PLAN
A PROGRAM OF THE TCEQ

OUR WATER
Take it personally!

Green Completions

Better Buildings CHALLENGE
U.S. DEPARTMENT OF ENERGY
FORT WORTH

Sustainable
Public Rights of Way

TEES
ENERGY SYSTEMS LABORATORY
TEXAS A&M ENGINEERING EXPERIMENT STATION

TEXAS SMARTSCAPE®

Regional Public Works

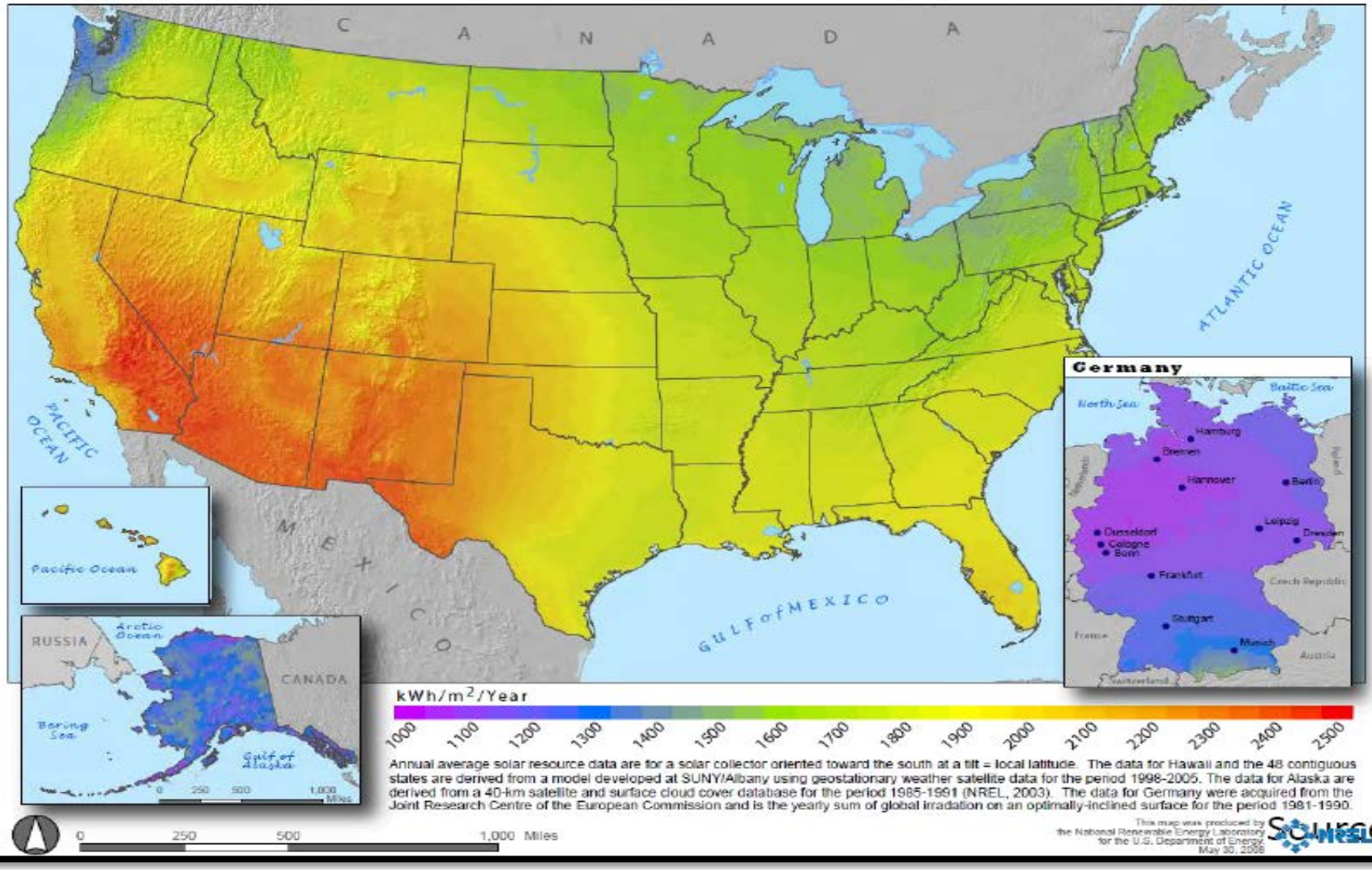
KEEPING PACE INTEXAS

iSWM

Celebrating Leadership In Development Excellence
Center of Development Excellence

SOLAR AND EV INITIATIVES

SOLAR IN TEXAS



Source: NREL

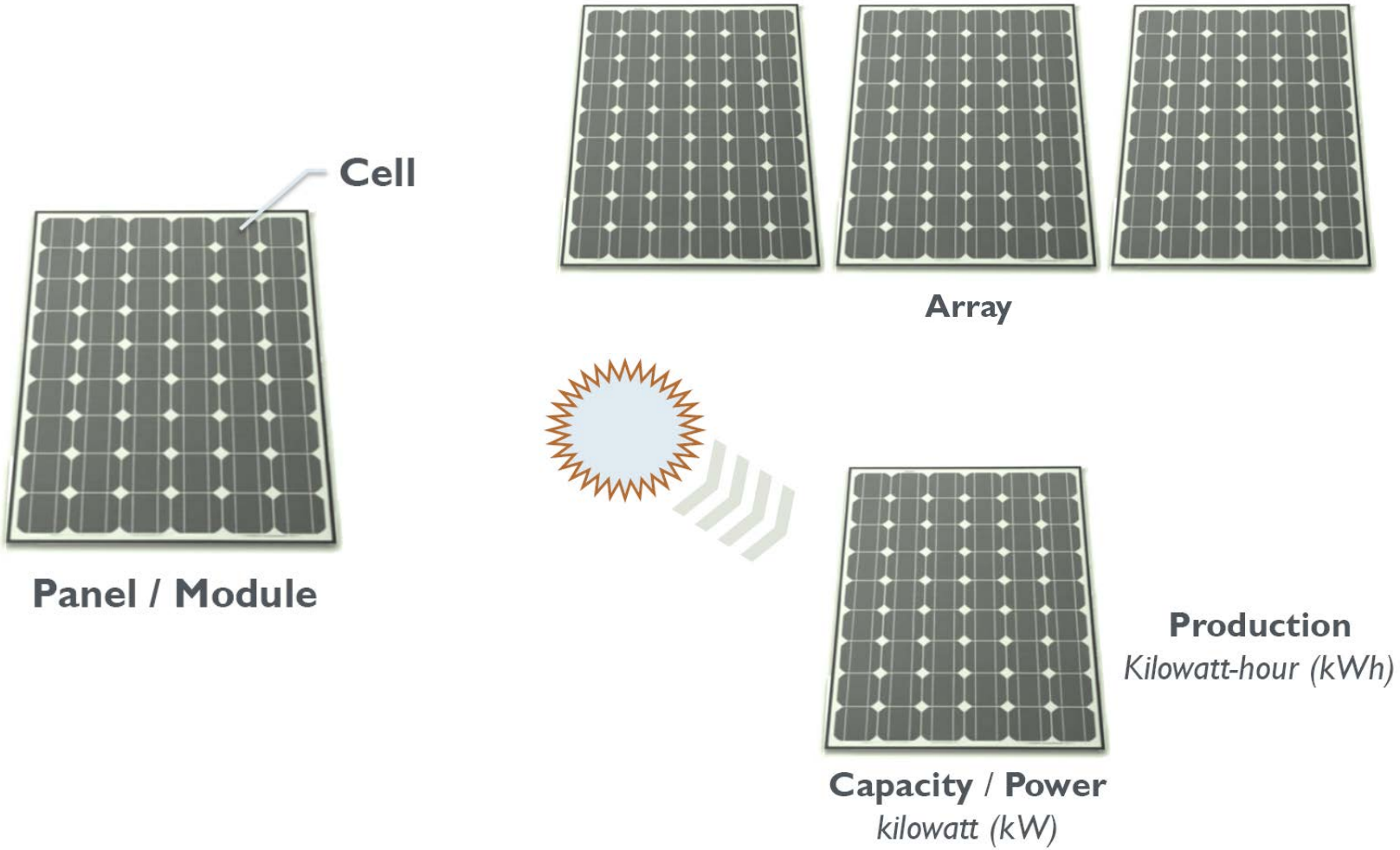
SOLAR DRIVERS IN TEXAS

The Electric Reliability Council of Texas **(ERCOT)**

Competitive Renewable Energy Zones (CREZ) Transmission Line

Source: ERCOT

SOLAR BASICS



SOLAR BASICS

Residence
5 kW

Factory
1 MW+

Office
50 – 500 kW

Utility
2 MW+

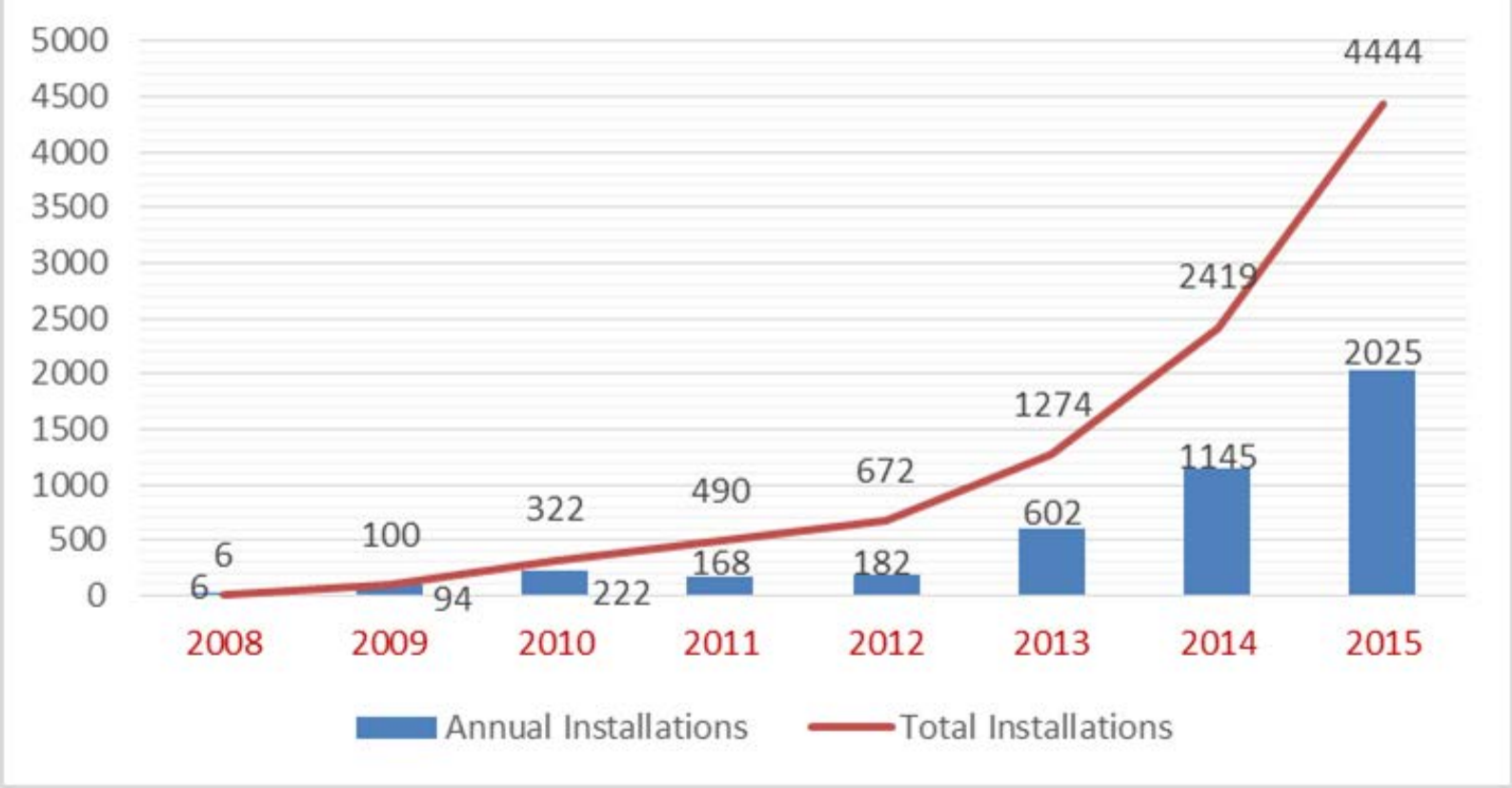
TYPES OF SOLAR, PV

1. Large installations built on the transmission system (West Texas)
2. Large installations built on the distribution system (Population centers)
3. Small installations built on distribution system (Rooftop or ground-mount)

OTHER SOLAR APPLICATIONS

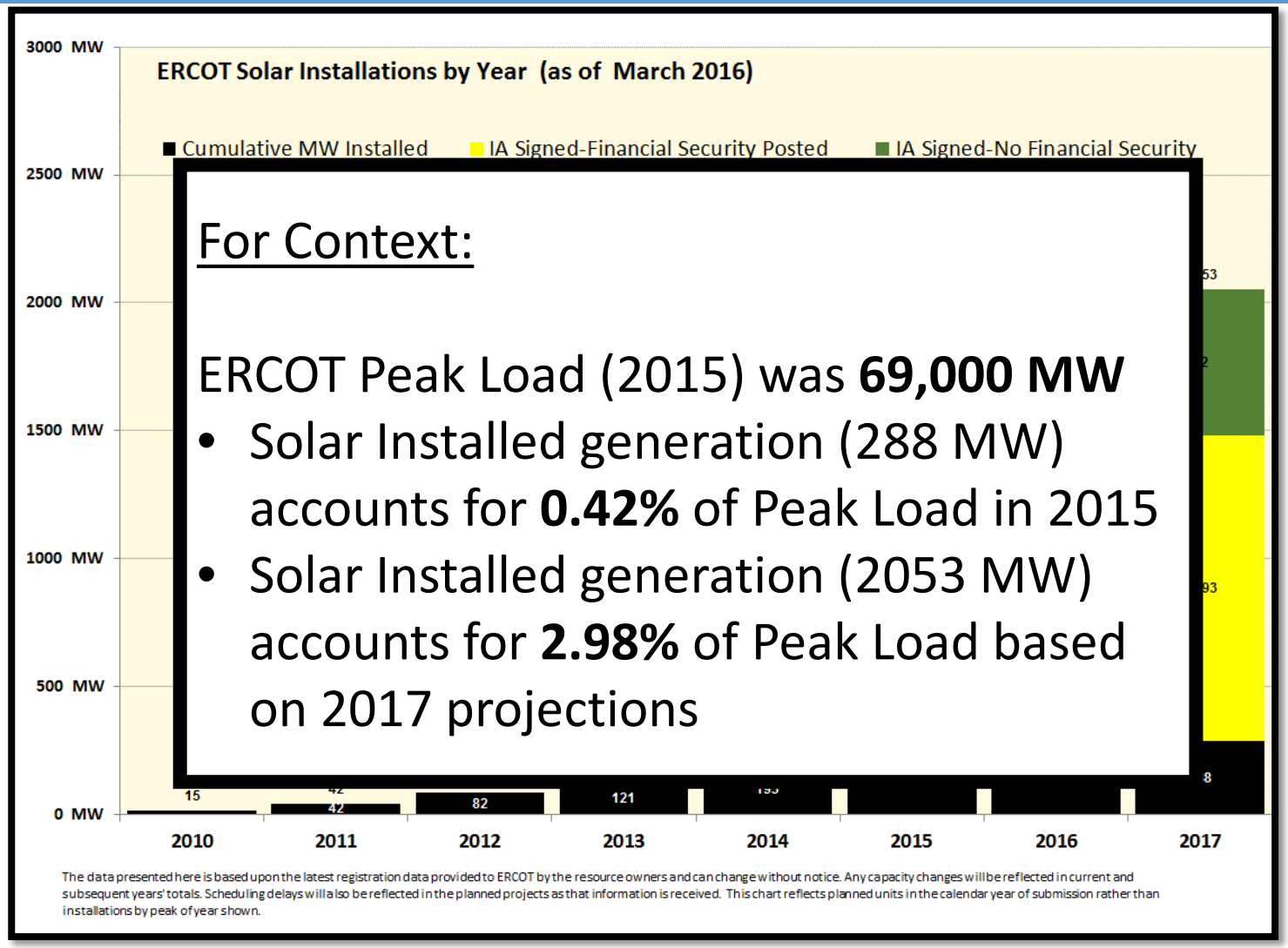
SOLAR GROWTH IN NORTH CENTRAL TEXAS

Annual and Total Rooftop Installations (2008 – 2015)



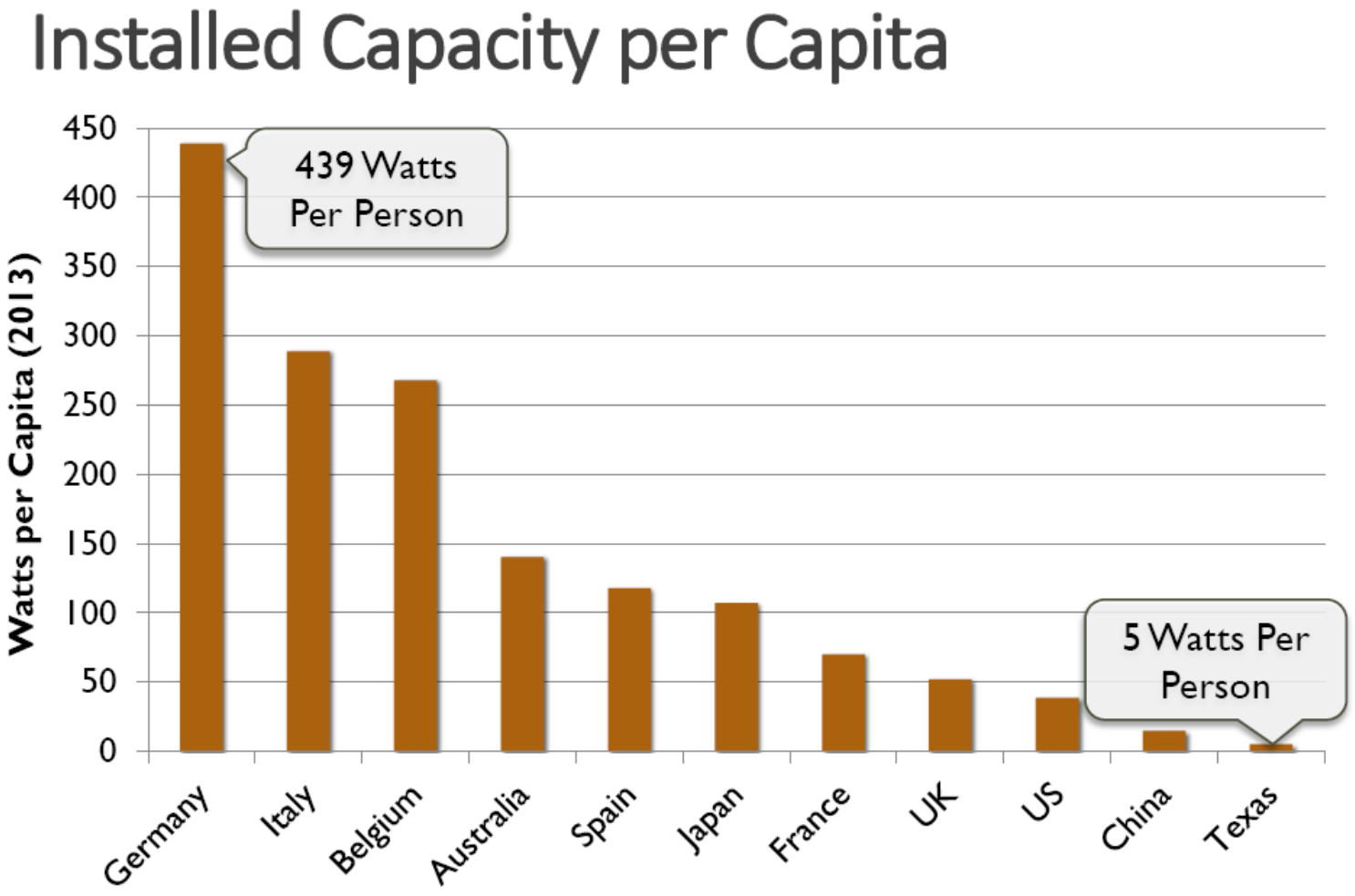
Source: North Texas Renewable Energy Group (NTREG)

SOLAR GROWTH IN TEXAS



Source: ERCOT Generation Interconnection Status Report, 2016

SOLAR, COMPARED GLOBALLY



Source: REN21, World Bank

SOLAR, COMPARED NATIONALLY

Source: Solar Energy Industries Association, Top 10 Solar States, March 2016

NCTCOG SOLAR INITIATIVES

Solar Ready II

- Coordinate with local governments
- Establish best management practices
- Reduce the soft costs of solar

SECO
State Energy Conservation Office

- Increase access to solar
- Solar Trainings
- Solar 101 materials
- Resources aimed at niche markets (MOUs/ECs/ISDs)

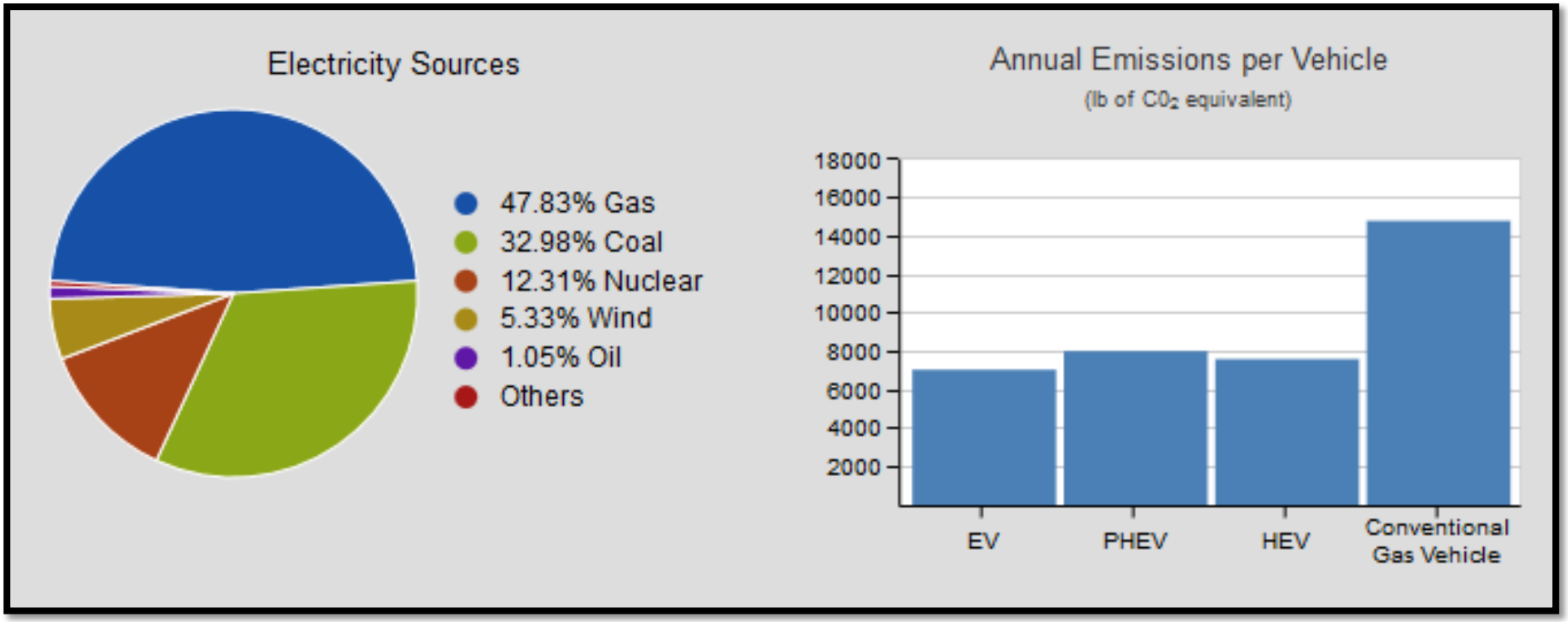
ELECTRIC VEHICLES

REASONS TO CHOOSE AN ELECTRIC VEHICLE (EV)

1. Lower Emissions
2. Save Money
3. Independence
4. Safety

WELL TO WHEELS EMISSIONS

TEXAS

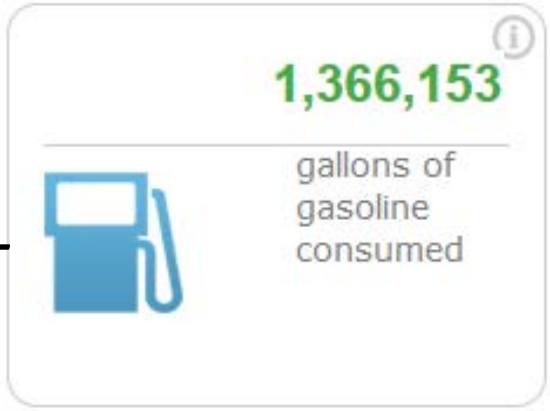


Source: U.S. Department of Energy Alternative Fuel Data Center

TAILPIPE EV EMISSION BENEFITS

CO_2 Emissions Reductions in DFW Region Equal to:

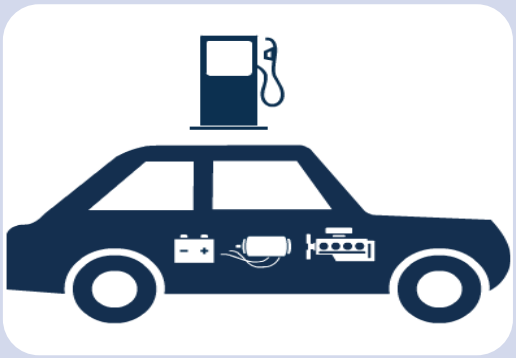
-or-



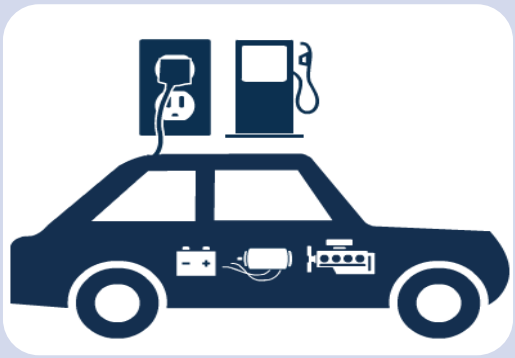
- or offset by -

DFW EV Registration Emissions Impacts (Tons per Year)	
NO_x	2.72
VOC	0.69
CO_2	16,980.38
PM	0.31
CO	168.59

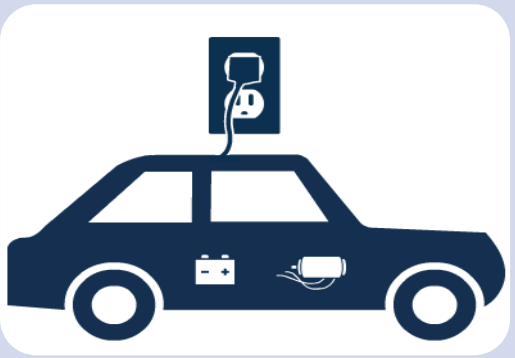
TYPES OF EVS



Hybrid Electric Vehicle (HEV)



Plug-In Hybrid Electric Vehicle (PHEV)

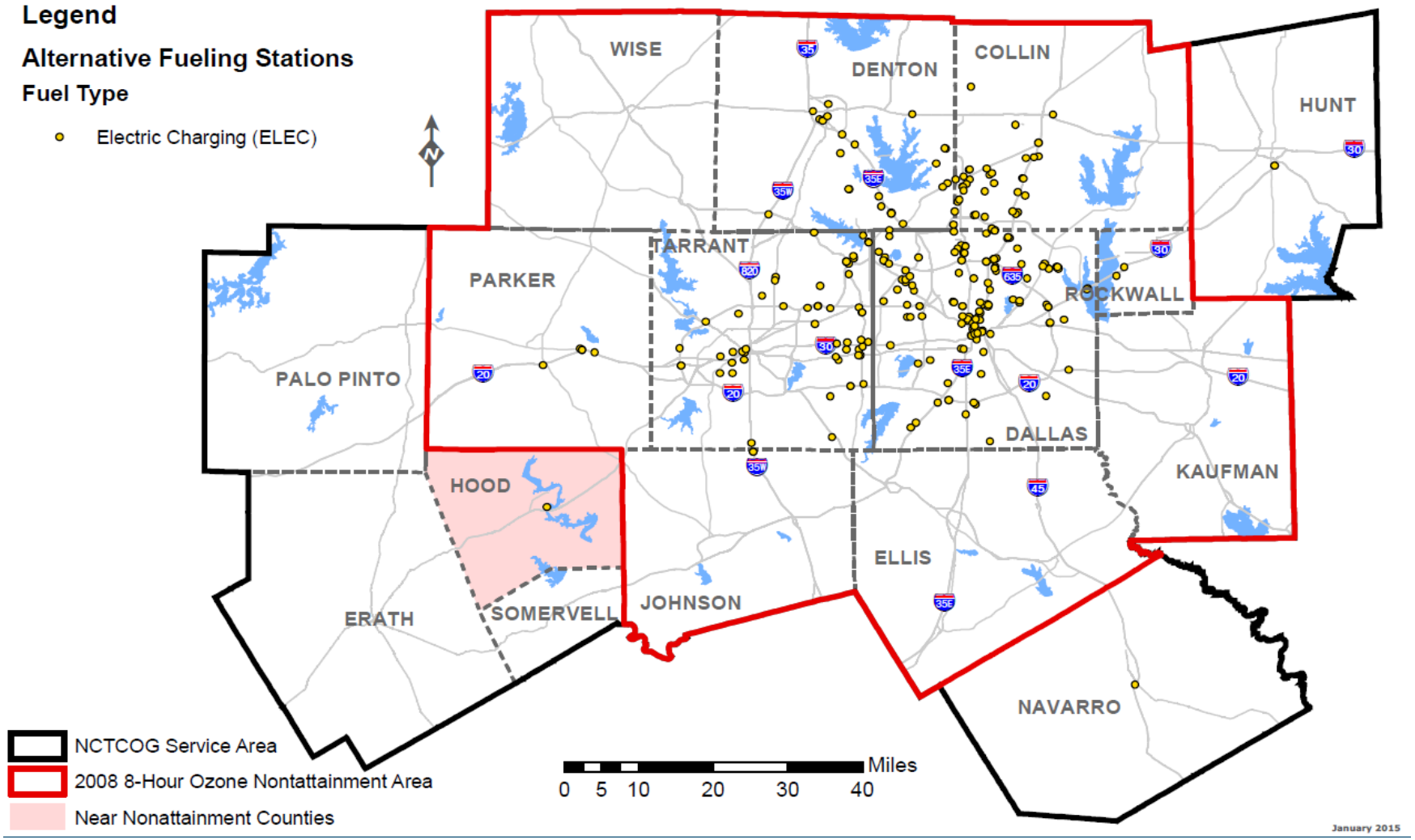


All-Electric Vehicle (EV) or Plug-In Electric Vehicle (PEV)

EVSE & CHARGING

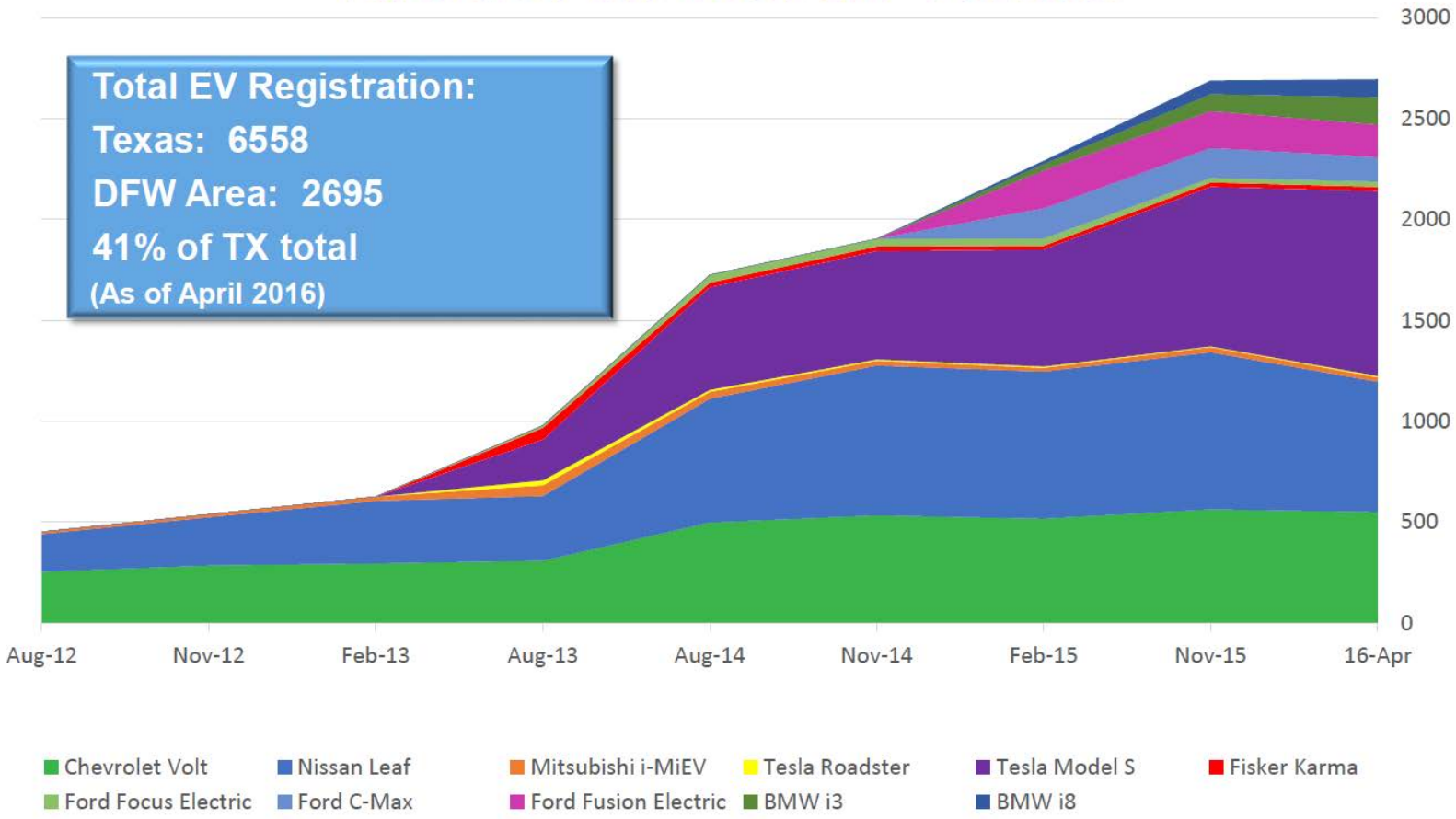
Type	Time Needed to Charge 10 Miles
Level 1	1h 40 min
Level 2	~ 30 min
Fast Charging	< 5 min

NORTH CENTRAL TEXAS EV CHARGING INFRASTRUCTURE

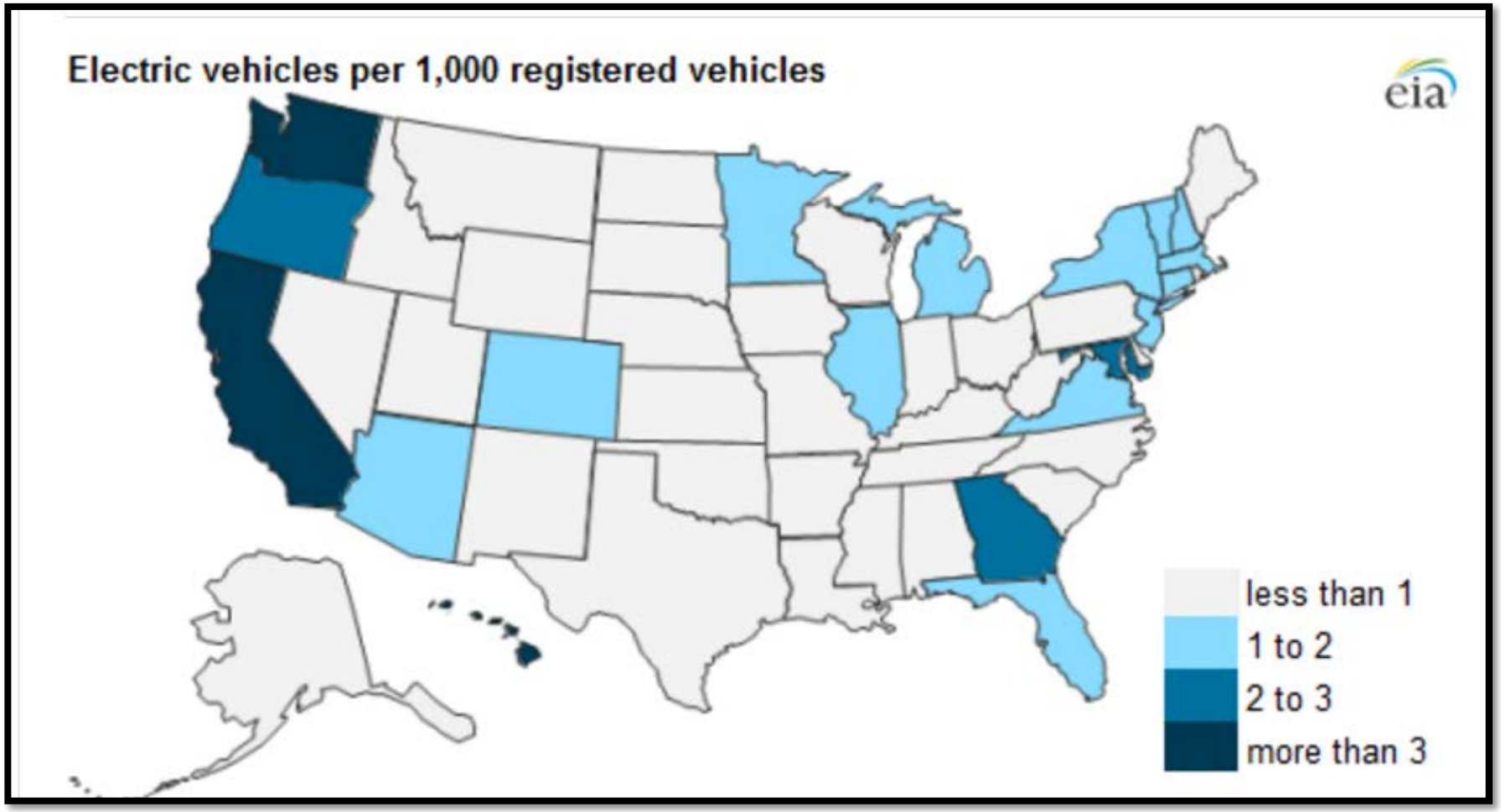


EV ADOPTION IN NORTH TEXAS

Registration by Electric Vehicle (EV) Model in North Texas



EV MARKET PENETRATION



Source: U.S. Energy Information Administration, based on Federal Highway Administration data and R.L. Polk & Company

ELECTRIC VEHICLE NORTH TEXAS (EVNT)

evnt
Electric Vehicles North Texas

Goal/Description

- Promote Adoption & Use of Electric Vehicles (EVs)
- by Offering On-site Charging at Places of Employment

NCTCOG Resources

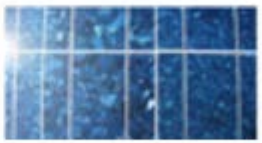
- EV Fact Sheet
- Guide to Claiming EV Incentives
- Upcoming Workshops & Meetings

How to Get Involved

- Attend EVNT Stakeholder & DFWCC Meetings
- Sign Up to Receive Email Announcements
- Contact NCTCOG Air Quality Staff
- Join the Workplace Charging Challenge
- Install On-Site Charging

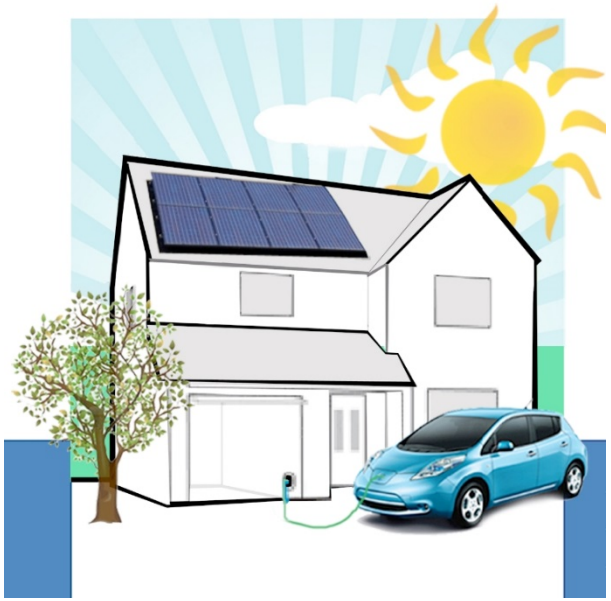
THE SOLAR + EV CONNECTION

Potential to achieve true zero emission vehicles!!

EV +  +  = ZEV

CAPACITY, DEMOGRAPHICS, & ECONOMICS

Convenience to plug in, recharge, and harness “sun miles”



Capacity: 9 Solar panels provide roughly enough electricity to power 12,000 miles of electric driving each year

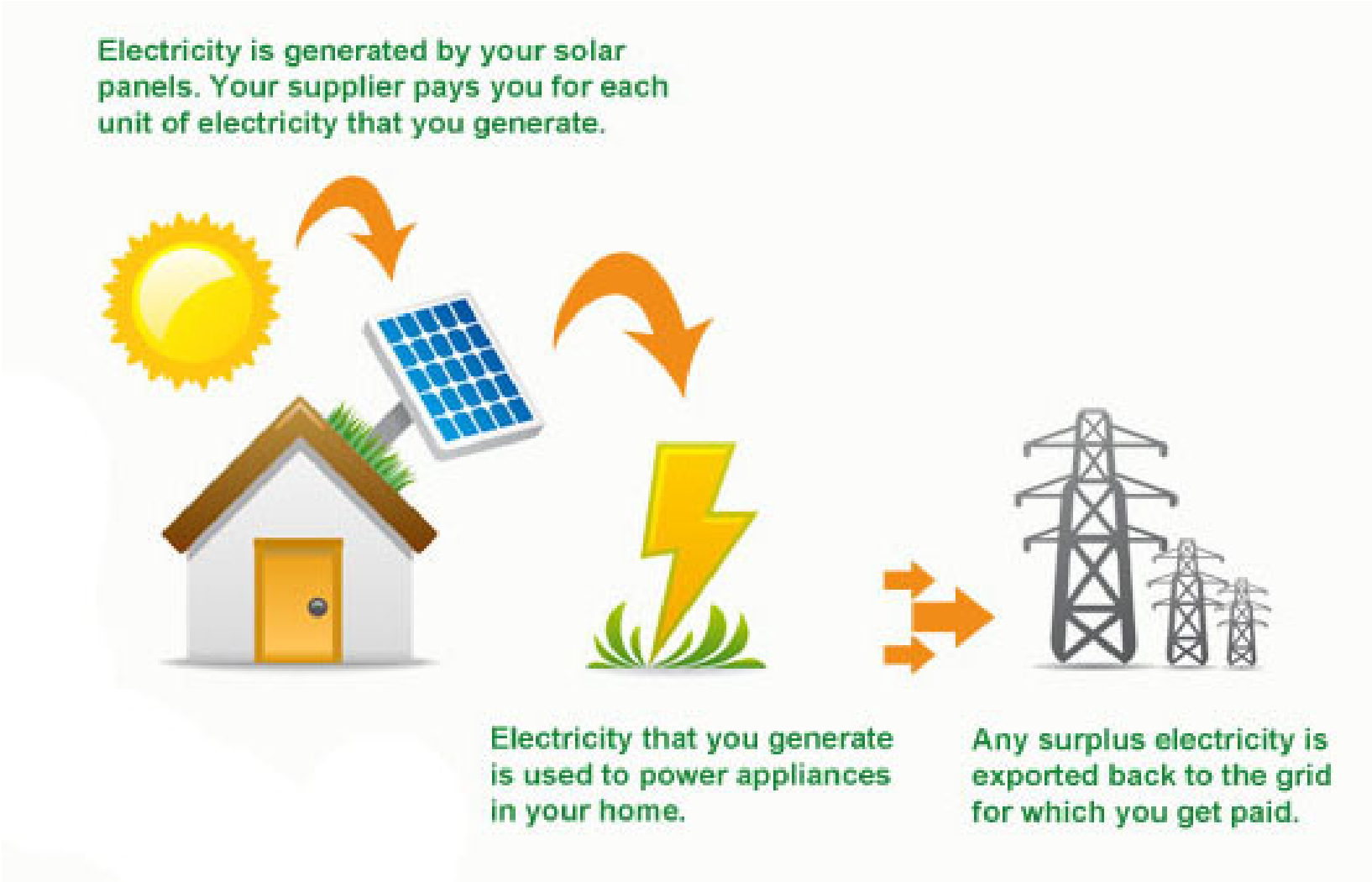
Demographics:

- 32% of EV owners have installed rooftop solar
- EV owners are 6.6% more likely than non-EV owners to install solar

Economics: When used for EV charging, payback for PV systems can be as short as 2 years

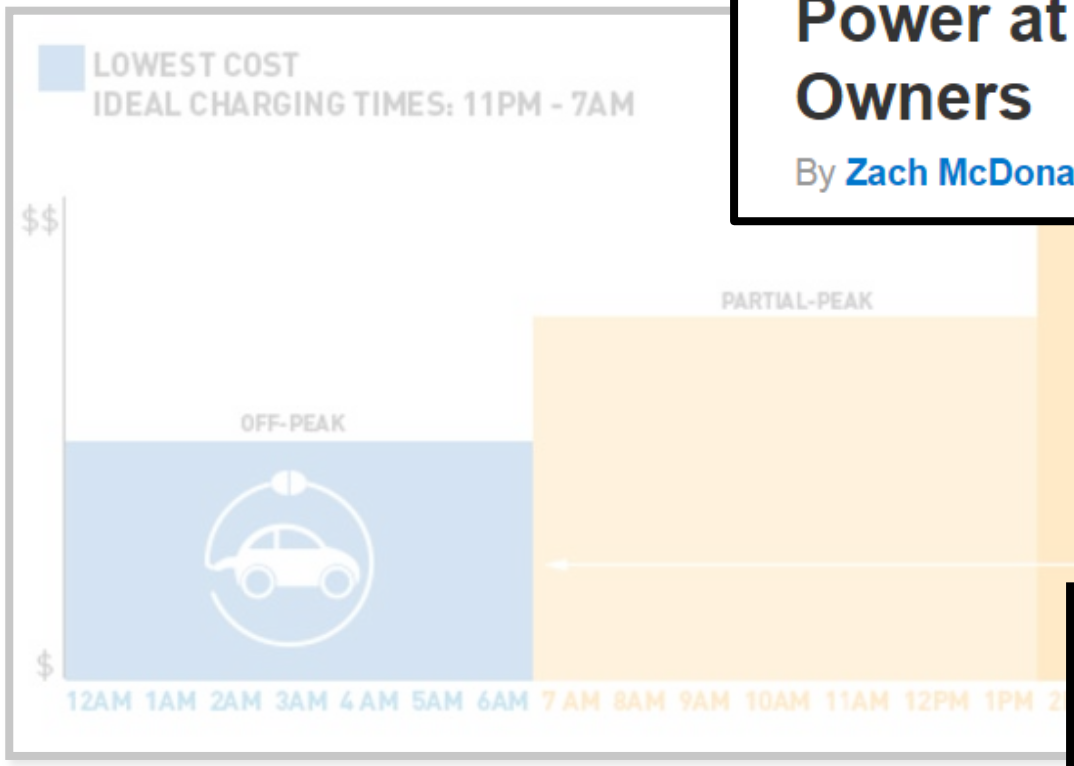
ROLE OF UTILITIES

SOLAR BUY-BACK



Source: Smart Energy Initiative of Southeastern Pennsylvania

TIME OF USE PRICING



Source: Pacific Gas & Electric "Making Sense of the Rates"

Texas Energy Provider Gives Free Power at Night to Electric Car Owners

By **Zach McDonald** · July 31, 2013

TXU energy

Time of Use Pricing

SOLAR + EV OUTLOOK

- Positive Trends
- Long Way to Go
- Potential of disruptive technology

BUSINESS

Eight U.S. states to roll out electric vehicle plan

to put **3.3** million zero-emission vehicles on their roads by 2025

CLEAN DISRUPTION OF ENERGY & TRANSPORTATION

The industrial age of energy and transportation will be over by 2030. Maybe before.

CONCLUSION & FOR MORE INFORMATION

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