



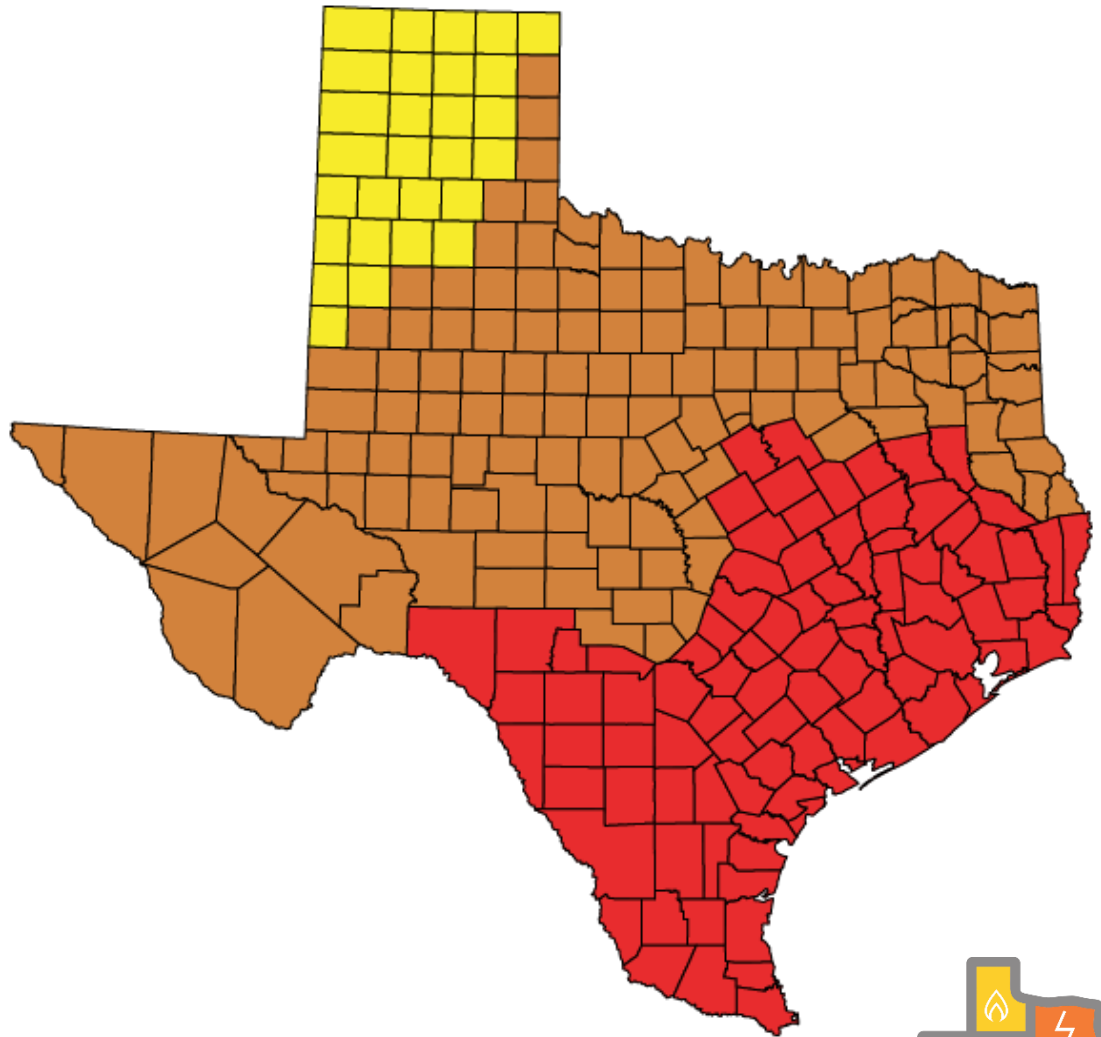
==== *It's like a* ====

WHOLE OTHER COUNTRY

=====



- Three climate zones:
2,3,4
- East to West – 850
miles
- South to North – 830
miles
- 254 counties
- 1,216 incorporated
cities
- 1,265 public school
districts
- 9,317 public schools
- 5,000,470 students
- 289,480 full-time
teachers

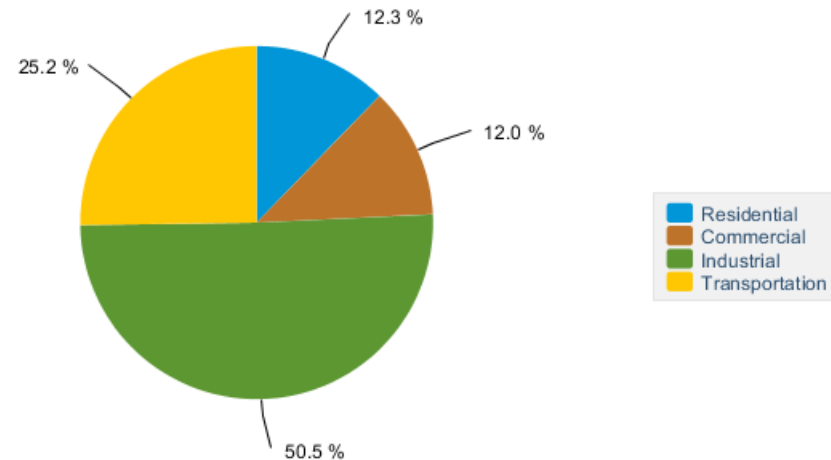


SECO

Energy

- 1st in the nation in the production of crude oil, natural gas and electricity
- 1st in installed wind capacity 22,799 MW (4X California)
- 1st in consumption
- 1st in EE potential (US DOE)

Texas Energy Consumption by End-Use Sector, 2017



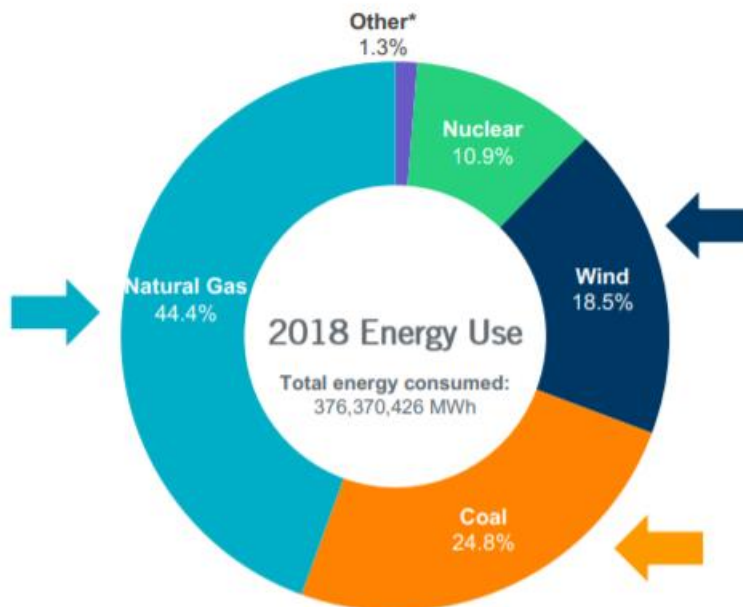
Source: Energy Information Administration, State Energy Data System



ERCOT Energy Sources in 2018

Natural Gas

- Natural Gas has historically played a large role in Texas power generation.
- Energy prices in ERCOT are very sensitive to gas prices.



Wind

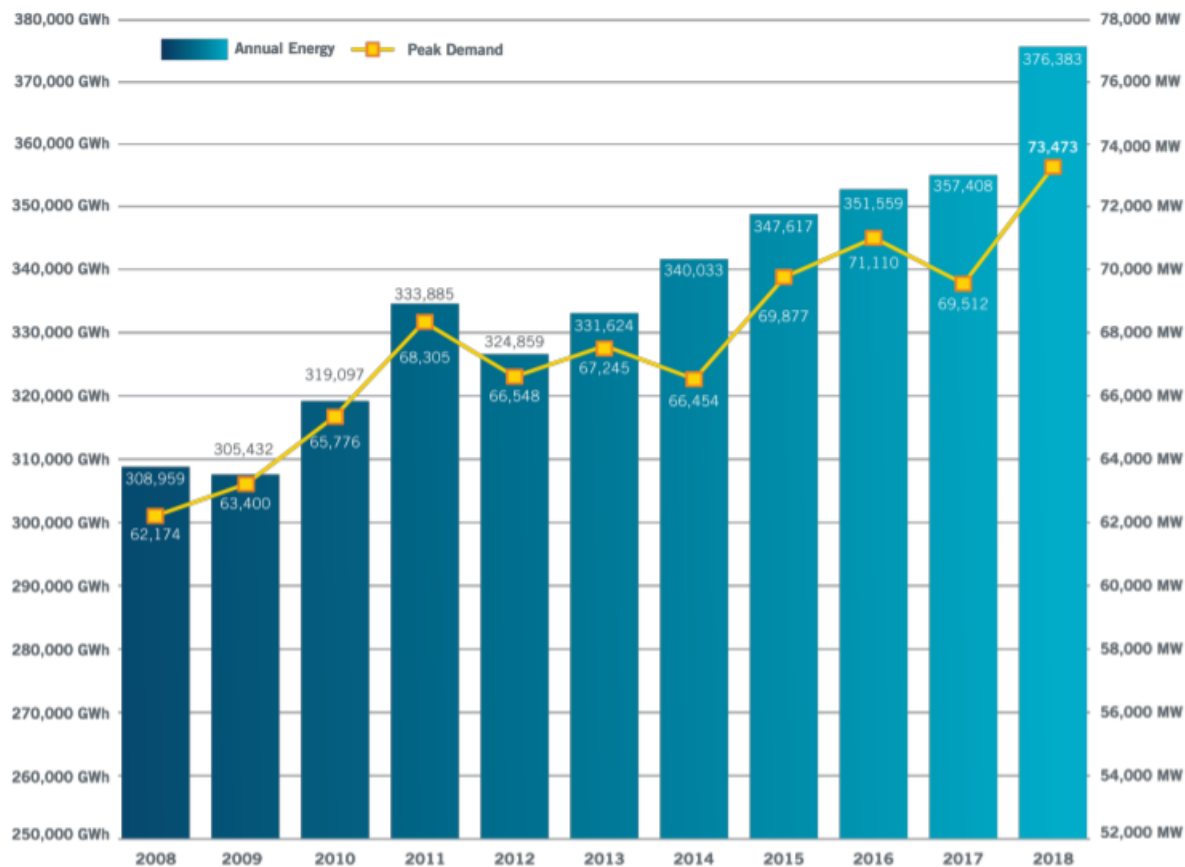
- Geographic diversity growing.
- Wind generation record: 19,672 MW (Jan. 21, 2019, 7:19 p.m.)
- Wind penetration (load served): 56.16% (January 19, 2019, 3:10 a.m.)

Coal

- Coal fleet includes some newer units.
- Retired or permanent mothball status 2018/2019: 5,583 MW

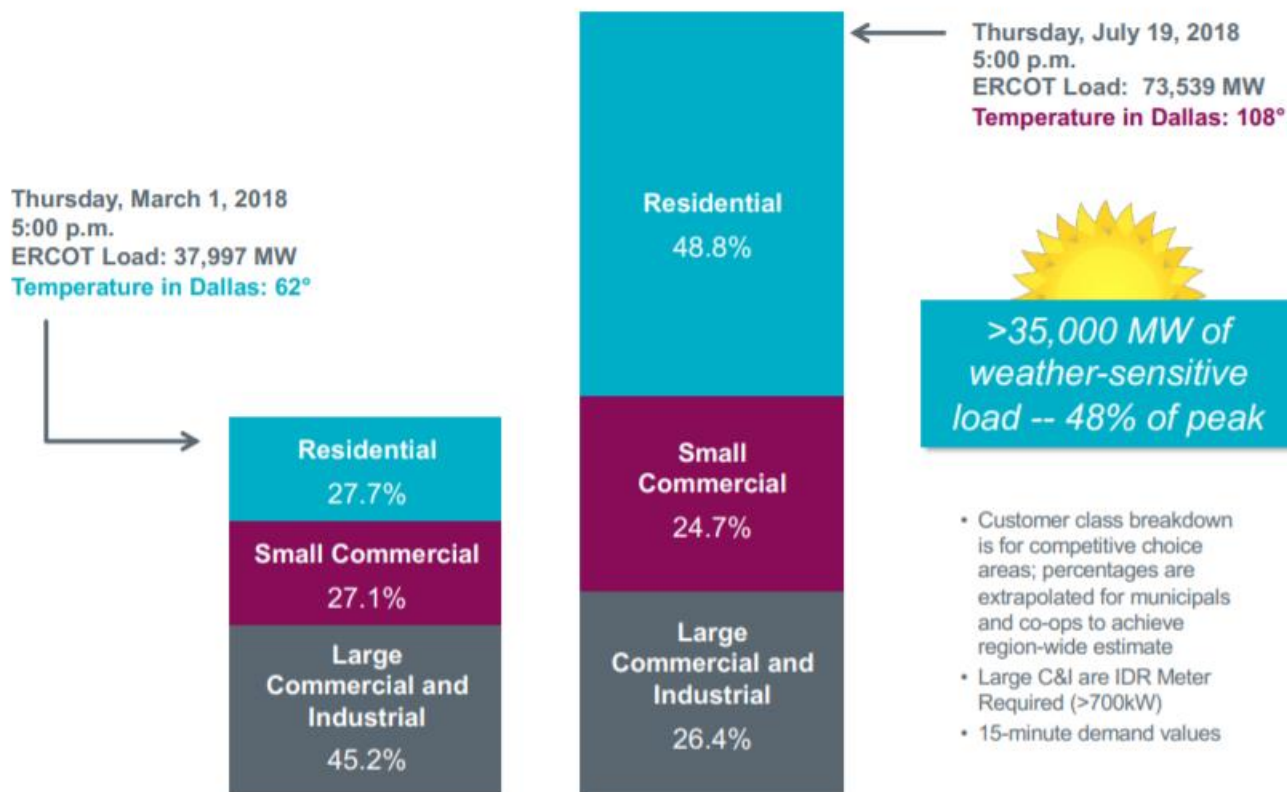
*includes solar, hydro, petroleum coke, biomass, landfill gas, distillate fuel oil, net DC Tie and Block Load Transfer imports/exports, and an adjustment for Wholesale Storage Load

Annual Energy and Peak Demand (2008-2018)



SECO

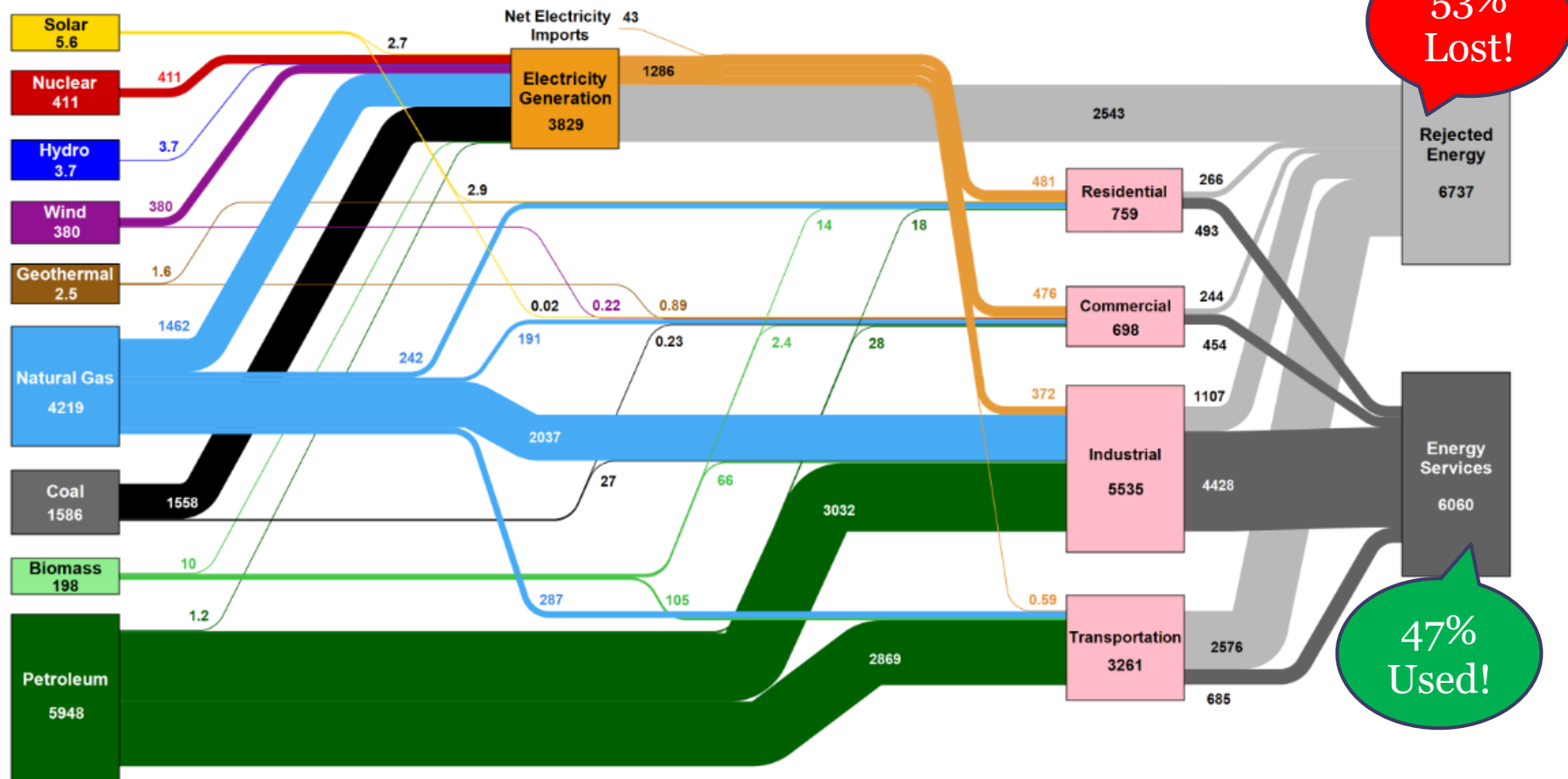
Summer Weather Impacts on Load by Customer Type



Untapped EE “Resource”

Texas Energy Consumption in 2014: ~ 12797 Trillion BTU

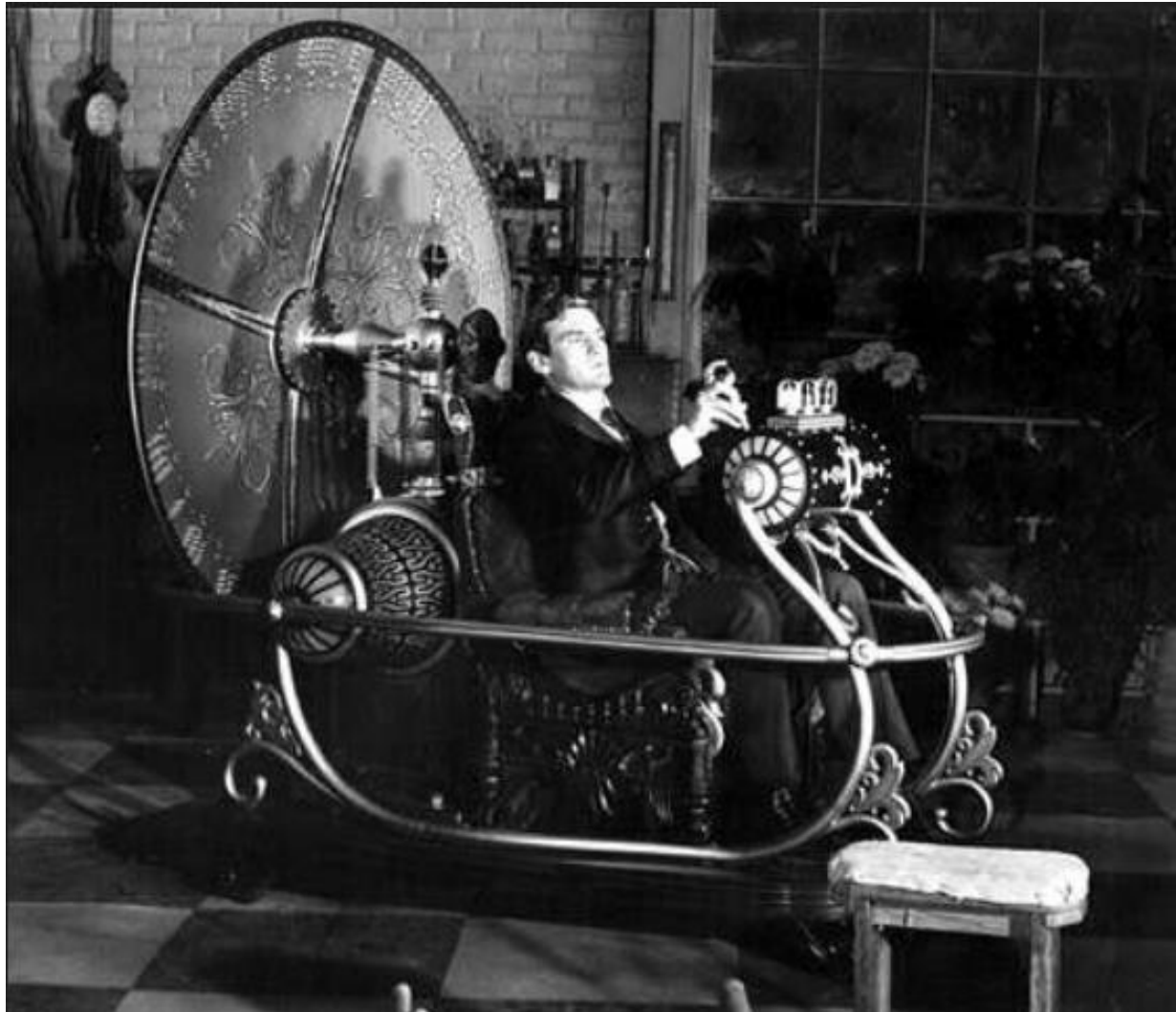
Lawrence Livermore
National Lab



Energy Legislation and Energy Codes

- Driven by energy issues
 - Shortages
 - Prices
 - Availability (includes Natural Disasters)
 - Environment





1971

- July 4, 1971. First comprehensive energy message to Congress



1971



- National goal. Committed to complete a Liquid Metal Fast Breeder Reactor demonstration plant by 1980.
 - Calls the breeder reactor the best hope for meeting the growing demand for economical clean energy.



1973 - A Very Busy Year



- Energy Policy Office established.
 - Responsible for formulating and coordinating energy policies at the presidential level.
- October 6, 1973. The Yom Kippur War breaks out in the Middle East.
- October 17, 1973, OPEC declares an oil embargo, first "energy crisis."



1973



- **Project Independence**

- Goal of achieving energy self-sufficiency by 1980.
- Recalling the Manhattan Project, Nixon declares that American science, technology, and industry can free the United States from dependence on foreign oil







With Tourist Parade Slowing, Disney Diversifies Operations

What has on 18-story Cinderella's Castle, a scintillating profits record, a brand-new cattle ranch in Florida and — suddenly — a lot of worries?

If you answered "Walt Disney Productions," you hit it right on Mickey Mouse's shiny nose. Some measure of Disney's worries came to light last week. A flood of bad news was made public in an unusual burst of candor by the company itself: Attendance figures have stopped climbing at Disney's two giant amusement parks. In fact visitors to Walt Disney World in the critical Christmas - New Year's period fell 8.9 per cent below year-earlier levels, and the work force is being reduced.

IT ISN'T ONLY had news for the far-flung Disney organization, of course.

Since Disney World near

the energy shortage is worldwide and tourism suddenly has been clobbered everywhere. But in Disney's fiscal 1974 first quarter ended Dec. 31, the company reported last week, Disney World attendance slipped 4.8 per cent below the same quarter a

year ago (to 1,957,000, or an average of about 21,300 a day).

That covers the period from Oct. 1 through Dec. 31. There's evidence that the downturn has even worsened since New Year's Day, for the report said attendance in the



REVENUES-MILLIONS

period Oct. 1 through Jan. 6 (last Sunday) was down 5.4 per cent from the same period of a year ago.

Disney World's California twin — the 15-year-old Disneyland near Los Angeles — has fared slightly better (or less poorly). Disneyland's visitors in the September-December quarter totaled 1,738,000, off only 2.9 per cent from the year-ago period.

Strangely, though, a surprising surge of holiday business enabled Disney World to outperform Disneyland during the Christmas season. The California park's attendance plunged 13.8 per cent from the previous year between Dec. 15 and Jan. 6, compared to WDW's 8.9 per cent slump.

THE ENERGY crunch with its meat-axe effect on tourism came after November. (A Disney official says that al-

attendance-slump figures he disclosed in the other paw.

Disney Productions stock, previously a glamour issue, which had traded as high as \$123 a share in the past year, skidded again — to \$77.62 a share — on the very day that the financial report was issued. And that had Disney officials almost as worried — or bewildered — as the gasoline shortage.

"We just don't understand it," James L. Stewart, assistant to Disney President E. Cardon Walker, said when a telephone call found him in Burbank. "It's over-reaction, of course."

He blamed the financial press in part, citing one recent article which called attention to Disney's stockholder equity of \$17.71 per share. "They don't tell the public that on the books we



1974



- **Federal Administration Act of 1974**
 - Replaces the Federal Energy Office.
 - **Establish broad energy conservation measures and long-term energy planning.**
- August 9, 1974. Gerald R. Ford becomes President.



1975



- **The Energy Policy and Conservation Act**
 - Increase energy production and supply, **reduce energy demand, provide energy efficiency,** and give the executive branch additional powers to respond to disruptions in energy supply.
 - Directed National Institute of Standards and Technology (NIST) to **develop test procedures for measuring the energy efficiency of appliances.**



1975 Disney Movie



1970s



1976



1977



- **Solar Energy Research Institute (SERI)**
 - Federal facility dedicated to finding and improving ways to harness and use energy from the sun, is established in Golden, Colorado.



1977 - 1978



- **1977. Department of Energy Organization Act**
 - Department of Energy (DOE) is activated.
- **1978. Energy Tax Act**
 - Promote fuel efficiency and renewable energy tax credits.
- **1978 National Energy Conservation Policy Act**
 - Gave DOE the authority to set minimum energy performance standards (MEPS) to replace those set in 1975.
 - Changed the energy standards from voluntary to mandatory.
 - Federal standards took precedent over existing State standards.



1979



- June 20, 1979. Installed new solar panel display and promised **to increase subsidies for alternative fuel technologies.**
- Iranian revolution-resulting energy crisis.

https://www.youtube.com/watch?v=9UeEge30_BI, start4:00



Tourist spots siphon state gas reserves

By JIM BALL

Sentinel Star

State energy officials are siphoning gasoline from state-controlled emergency reserves to bolster supplies for fuel-thirsty tourists at Walt Disney World and Sea World.

Both attractions operate their own service stations, and each is receiving additional June gasoline supplies from the state's mandatory reserve of 17 million gallons.

Florida's oil suppliers are required to hold back 5 percent of their June supply, which is estimated at 349 million gallons, 20 million less than during May.

Walt Disney World attendance declines 15% since mid-June

Walt Disney Productions officials late Thursday announced increased revenues, net income and theme park attendance during their third quarter ended June 30, but noted motorist concerns

cent to 3,017,000 for the third quarter and 3.6 percent to 6,770,000 for the nine month period.

But Disney officials added that tourist concern over energy shortages began



1980



- **Energy Security Act**
 - Renewable Energy Resources Act
 - Solar Energy and Energy Conservation Bank Act
 - Geothermal Energy Act
 - Ocean Thermal Energy Conversion Act



Disney research seeks savings, image boost

By JOHN WARK
Starline Star

"They're sure not Mickey Mouse or The Hall of Presidents, but they're very much part of our operation," says Walt Disney World engineer Bob Cole.

"They're very peripheral. Maybe something will come of them in five to 10 years. They sound nice, but nobody should get too excited about them," says Harold Vogel, a leisure time stock analyst with Merrill Lynch Pierce Fenner & Smith Inc.

"They" are 17 research and development type projects in use at Walt Disney World which transport Disney guests from parking lot to theme park, purify water, control drainage, dispose of trash and generate energy.

As head of the Disney-owned and operated Reedy Creek Utility Company, Cole is familiar with most of the projects, particularly those related to energy.

In fact, the utility's headquarters is one of the research and development projects. Its roof structure is of an un-

systems is to Disney.

"Remember, nothing that's good works by itself, just to please you; you've got to make the damn thing work," it reads.

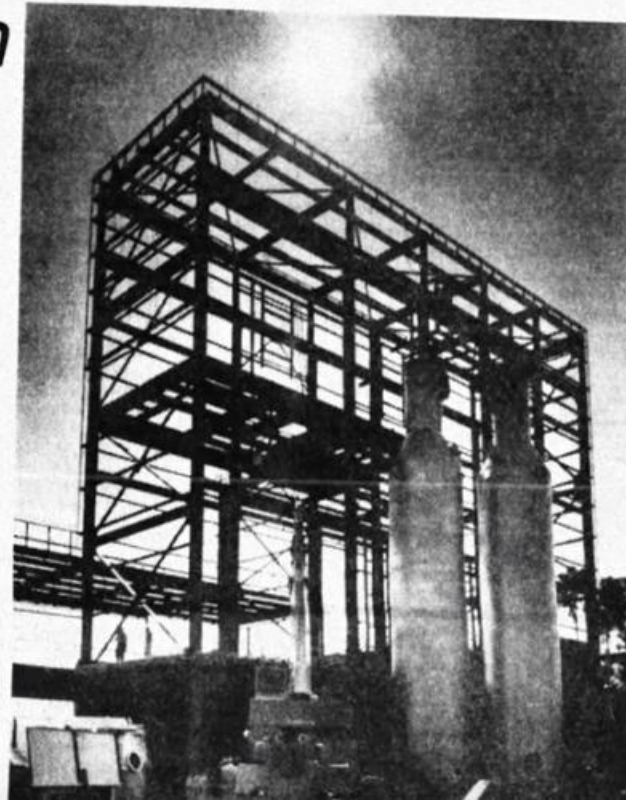
A Disney World news release on the solar project says it is only one of many projects on Disney property "where new systems and technologies for tomorrow's world can be demonstrated."

In Vogel's view, the projects give Disney two advantages: "You can never tell when something might come up that might make profits in the future" and "it's part of their futuristic image they want — why do something the old way when you can do something new."

Disney World public relations spokesmen decline to say precisely how much money Disney World's parent company, Walt Disney Productions, has fed into the 17 projects, but say the total runs into "tens of millions."

On the company's list of research projects, which it calls "advanced prototype systems," are:

A central energy plant



"There is no other system like it in the world," he says.

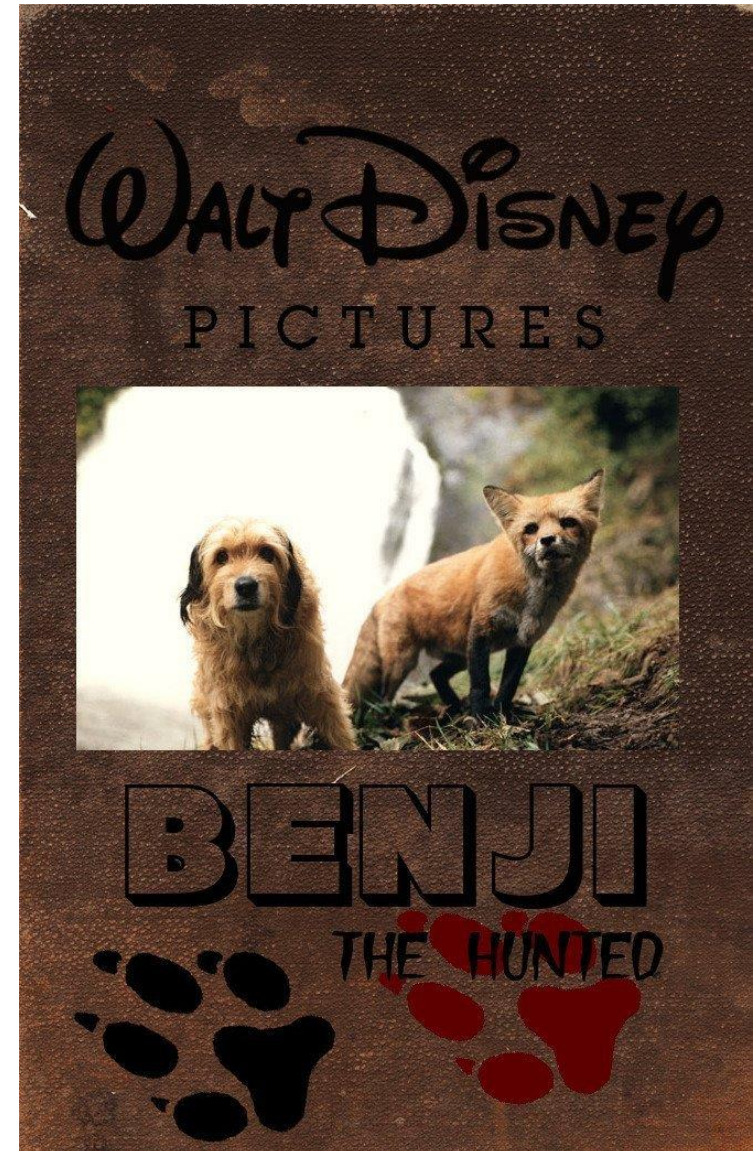
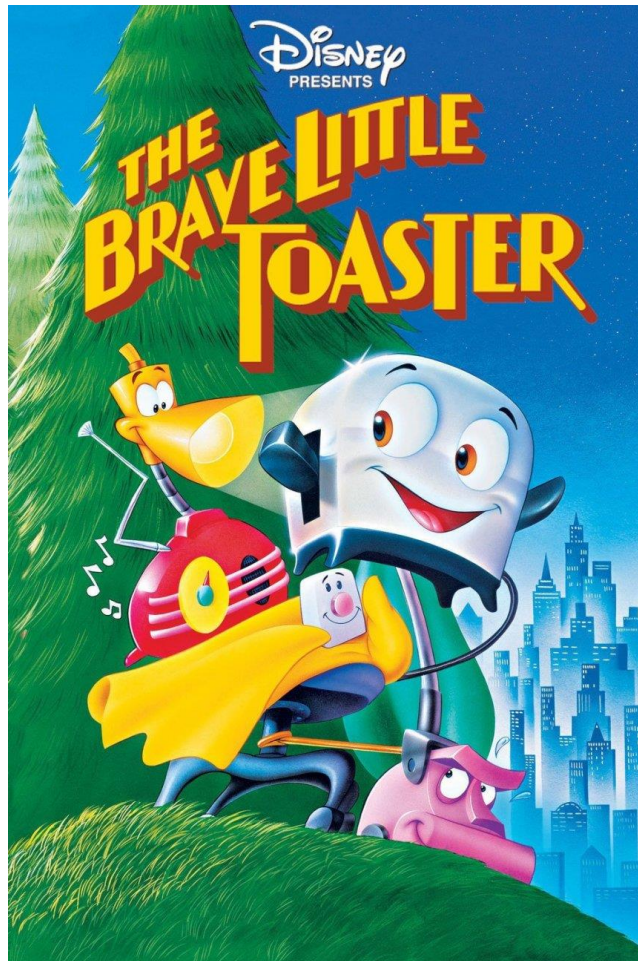
The SWEC (solid waste energy conversion) plant, Cole says, interested Disney because "we have a use for the byproduct — hot water."

The \$16 million construction cost for the plant, which is scheduled to begin operation in November 1981, came from the U.S. Department of Energy. The

The facility commenced operation in September 1982 and immediately experienced operational problems. After spending a total of \$15.5 million, the facility was shut down in March 1983 due to cost concerns. It reportedly burned 200 cu. ft. of natural gas per minute compared to the original projection of 78 cu. ft. per minute, used twice the electricity as was originally projected, had trouble controlling the temperature zones and never processed more than 85 tpd. Although it was reported that modifications could be made to cure those issues, no further investment was ever made.

SUMMARY OF FOUR EXPERIMENTAL SOLID

1987 Disney Movies



1987



- **National Appliance Energy Conservation Act of 1987**

- Established minimum efficiency standards for many common household appliances.
- Congress set initial federal energy efficiency standards and established schedules for DOE to review and update these standards.



1992



- **Elevates SERI to National Lab status**
- **Energy Policy Act (EPAct) of 1992**
 - Including tax incentives for renewable energy and energy conservation
 - Tax exemptions to promote alternative motor fuels Commercial Appliances, Motors, and Lighting
 - **“All States must review and consider adopting the national model energy standard.”**
 - 1992 National Model Energy Code-residential



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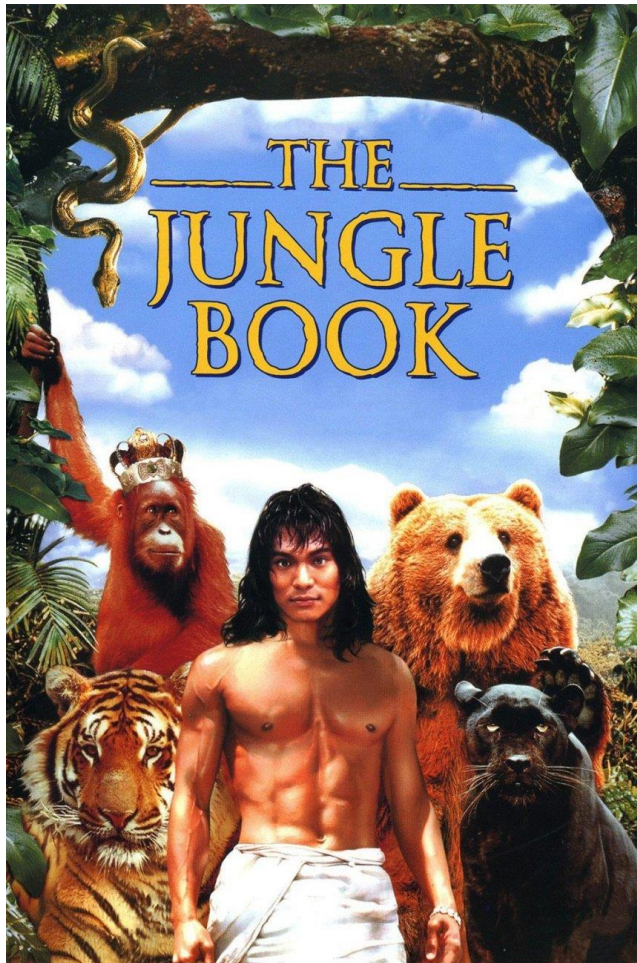
1993



- DOE reorganization.
- Consolidated previous offices into Office of Energy Efficiency & Renewable Energy (EERE).



1994 Disney Movies



1994

- Nations Three Model Code Groups decide to combining their efforts...for International Code Council
 - BOCA National Building Code (BOCA/NBC) by the Building Officials Code Administrators International (BOCA)
 - Uniform Building Code (UBC) by the International Conference of Building Officials (ICBO)
 - Standard Building Code (SBC) by the Southern Building Code Congress International (SBCCI)

1997



- Million Solar Roofs initiative.
 - Install solar energy systems on one million U.S. buildings by 2010



1990s



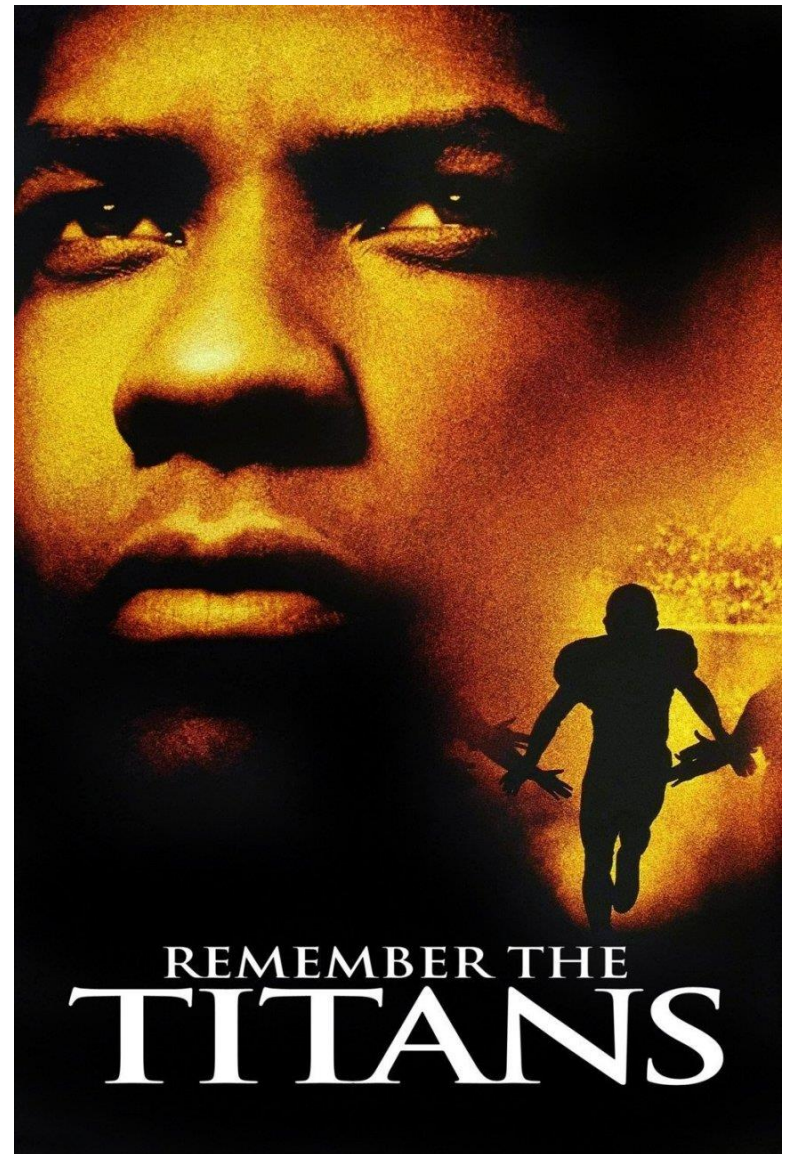
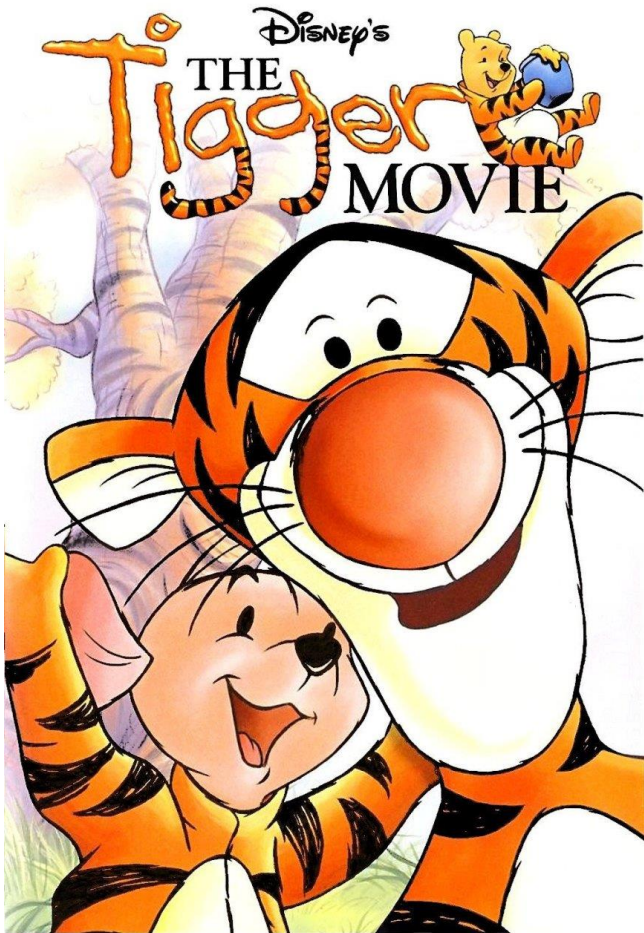
1999



- **Executive Order 13123**
- Requires all federal agencies to cut their building energy use by 35% (relative to 1985 levels) by 2010, and cut building greenhouse gas emissions by 30% (relative to 1990) in the same time period.



2000 Disney Movies

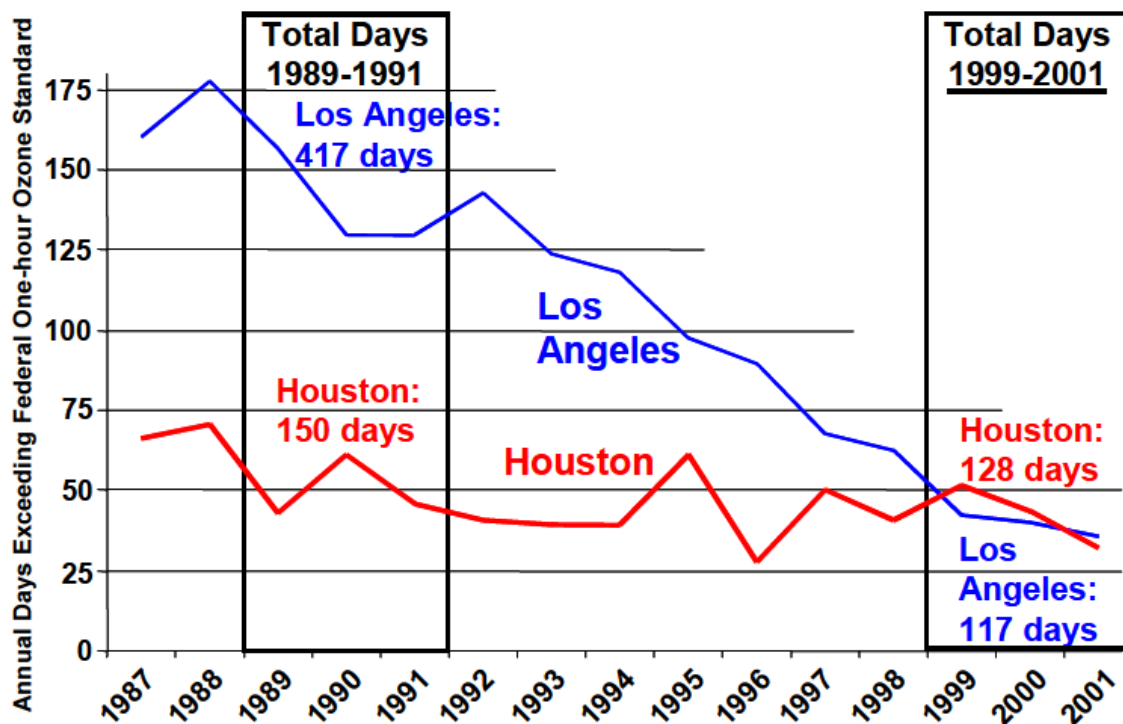


1997, 2000

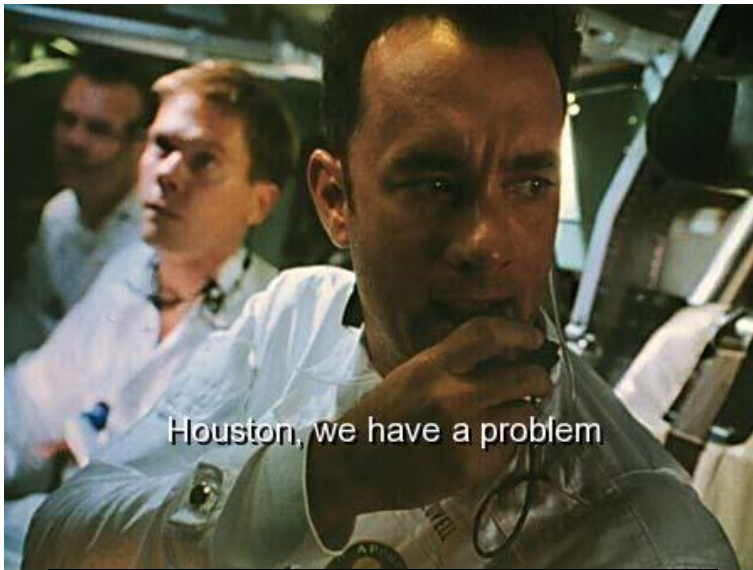
- 1997. First edition of ICC published
 - New code edition published every three years
- 2000. International Code series published
- 2000. International Energy Conservation Code published
 - “Design of energy-efficient building envelopes and installation of energy-efficient mechanical, lighting and power systems through requirements emphasizing performance.
 - The International Energy Conservation Code is designed to meet these needs through model code regulations that will result in the optimal utilization of fossil fuel and nondepletable resources in all communities, large and small.”

Most Polluted Cities

**Figure 1: Steady Progress in Los Angeles
Leaves Houston With Most Exposures to Ozone Smog**



Sources: South Coast Air Quality Management District; Texas Natural Resource Conservation Commission; and US Environmental Protection Agency.



Houston, we have a problem

The year 2000...

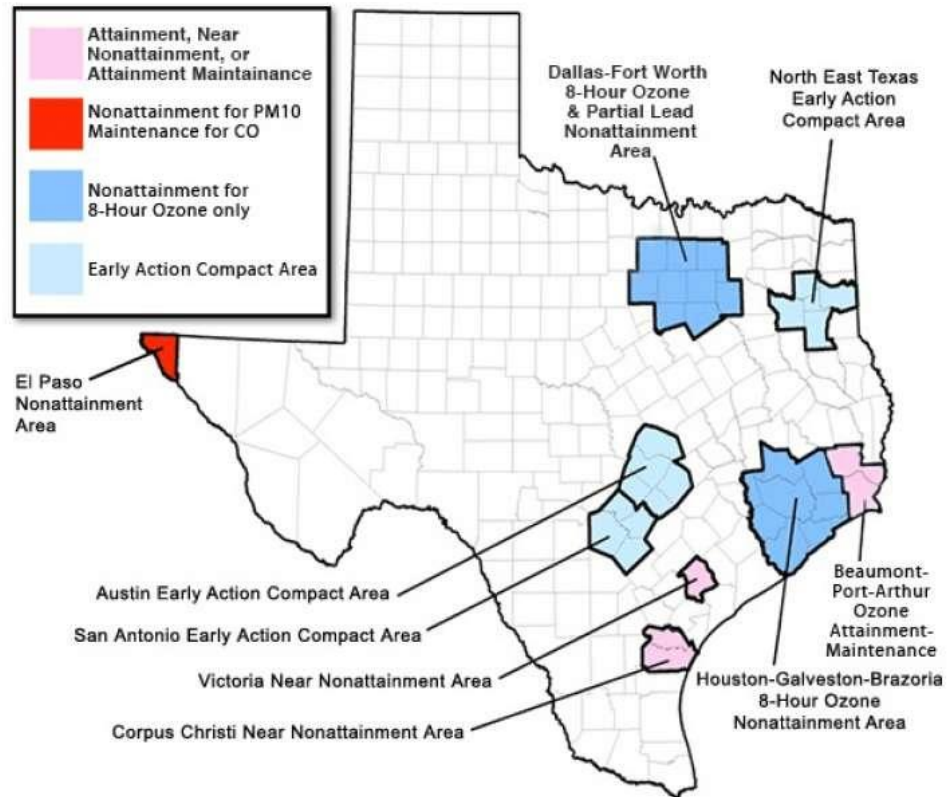


Legislative Response

SB5 (2001)

Texas Emissions Reduction Plan (TERP)

- Mobile source reduction incentives
- Reduced electricity consumption
 - Texas Building Energy Performance Standards (codes)
- Energy-Efficient Building Program (2003)
- Emissions credit for renewables (2005)
- Building energy code update process (2007)
- TERP extensions to 2019 (2009)
- Additional emissions crediting (2011)



Texas Health and Safety Code

Chapter 388

Texas Building Energy Performance Standards

Legislative findings...“an effective building energy code is essential to:

- 1) reducing the air pollutant emissions that are affecting the health of residents of this state;
- 2) moderating future peak electric power demand;
- 3) assuring the reliability of the electrical grid; and
- 4) controlling energy costs for residents and businesses in this state.”



2005



- **Energy Policy Act of 2005**
- Created new tax credits for energy efficiency and renewable energy
- National Renewable Fuels Standard that requires alternative fuels
- Requirement to increase energy efficiency in federal buildings
- New standards for commercial appliances, lighting, exit signs, traffic and pedestrian signals
- 3-week extension of Daylight Saving Time
- **Specified the most current model energy codes (IECC 2004, ASRAE 90.1 2004).**



2007



- **Energy Independence and Security Act**
 - Increase production of clean renewable fuels
 - **Increase the efficiency of products, buildings, and vehicles.**
 - Updated standards for household appliances, lighting, motors, walk-in coolers
 - Initiatives to promote research on and deploy greenhouse gas capture and storage options.



2008 Disney Movie



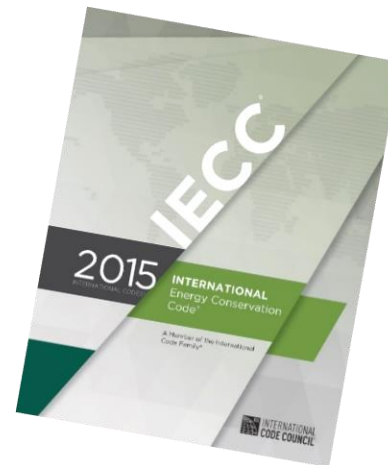
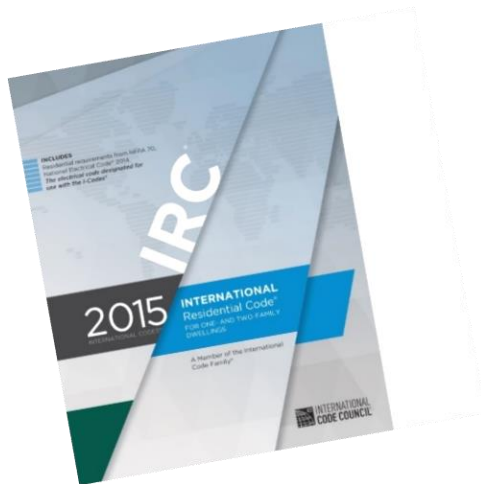
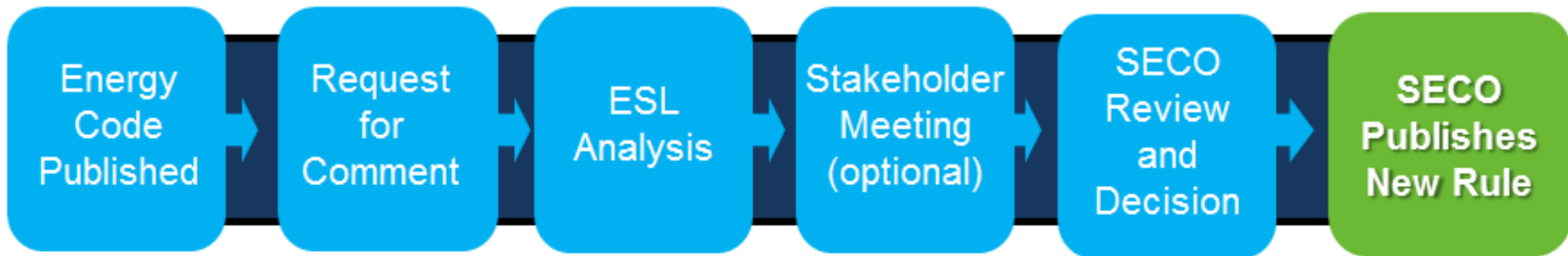
2009



- **American Recovery and Reinvestment Act (ARRA)**
 - States that accepted State Energy Program funding as a part of the [American Recovery and Reinvestment Act \(ARRA\)](#) also agreed to adopt a building energy code for residential construction that was equivalent to the 2009 IECC and one for commercial buildings that was equivalent to ASHRAE 90.1 2007.



Texas Code Update Process



Recent Legislation

- **H.B. 1736:** mandates energy efficiency for single-family residential construction; Chap. 11 of the 2015 IRC, effective 09/01/2016
- **TAC 19.53: 2015 IECC for commercial construction;** effective 11/01/2016
- **TAC 19.32: ASHRAE 90.1-2013 Standard or IECC-2015 for state funded new construction;** effective 06/01/2016
- **TAC 19.32: Water Conservation Design Standards for State Buildings and Institutions of Higher Education Facilities,** effective 06/01/2016



How long does it take to pay for the retrofit?

- Low Cost/No Cost Measures
 - **Lighting**
 - Power Factor Improvements
 - **HVAC**
 - Energy Management Systems
 - **Building Envelope**
 - Commissioning
 - **Steam Systems**
 - Water & Wastewater
- 0 – 6 months
 - **1 to 8 years**
 - 3 – 8 years
 - **7 to 20 years**
 - 4 to 12 years
 - **12 + years**
 - 1.5 to 6.5 years
 - **3 years +**
 - 3 to 8 years



Request for Preliminary Energy Assessment

<http://www.seco.cpa.state.tx.us/sch-gov/pea.php>

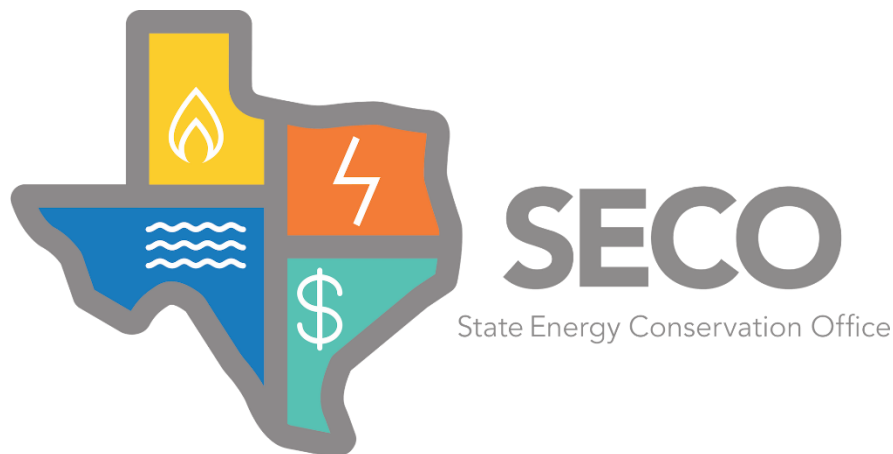
Sign up to receive funding opportunity notices

<http://www.seco.cpa.state.tx.us/funding/>

Sign up to receive energy code updates

<http://www.seco.cpa.state.tx.us/tbec/>





Eddy Trevino, P.E.
eddy.trevino@cpa.texas.gov

Stephen Ross (Preliminary Energy Assessments)
stephen.ross@cpa.texas.gov

Margaret Garcia (Remote Energy Assessments)
margaret.garcia@cpa.texas.gov

Fred Yebra (Energy Code Questions)
fred.yebra@cpa.texas.gov

