Falmouth Green Ribbon Commission on Energy and Climate Protection

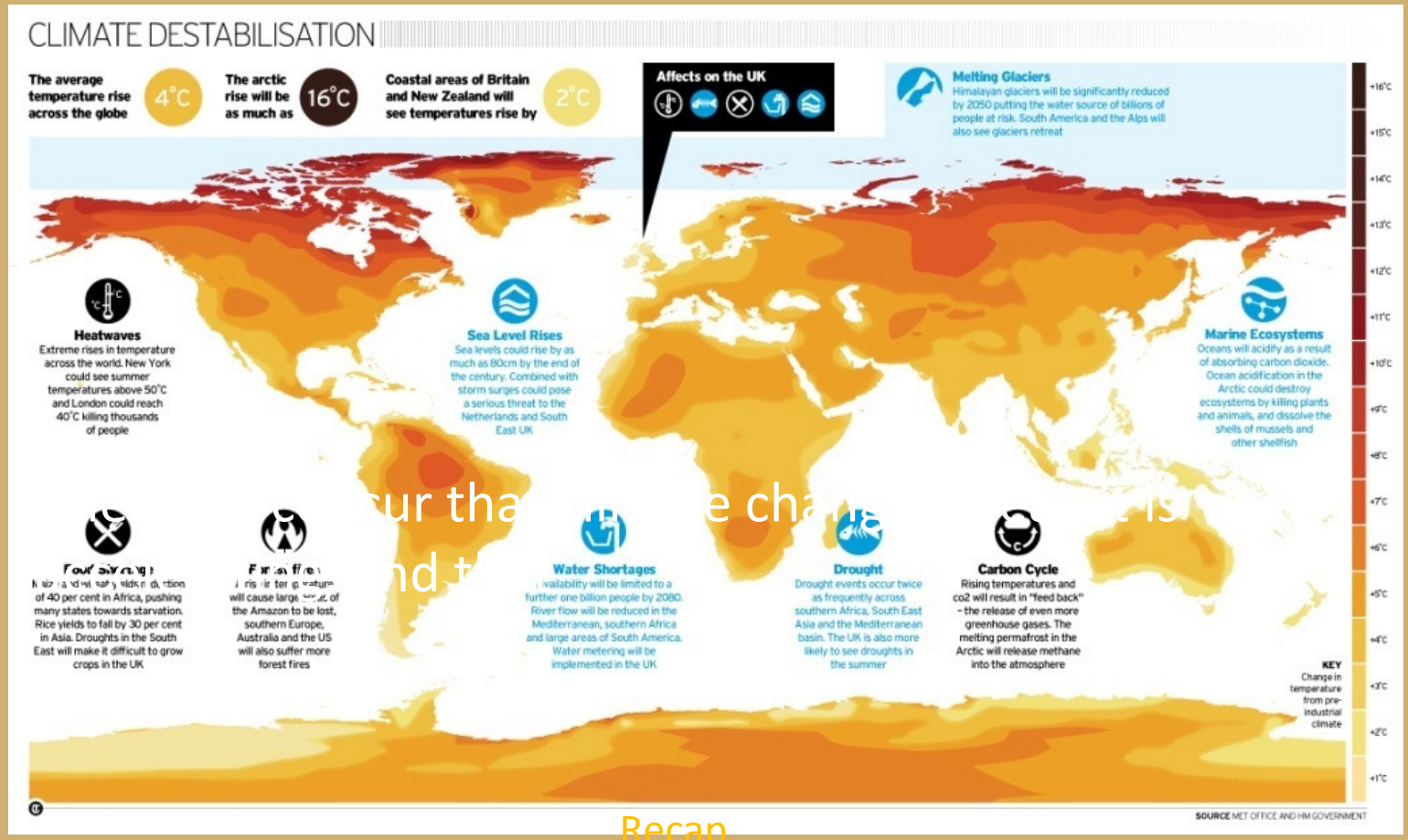
Recommendations: Part I

Energy Efficiency

Recap:
Commission Charge

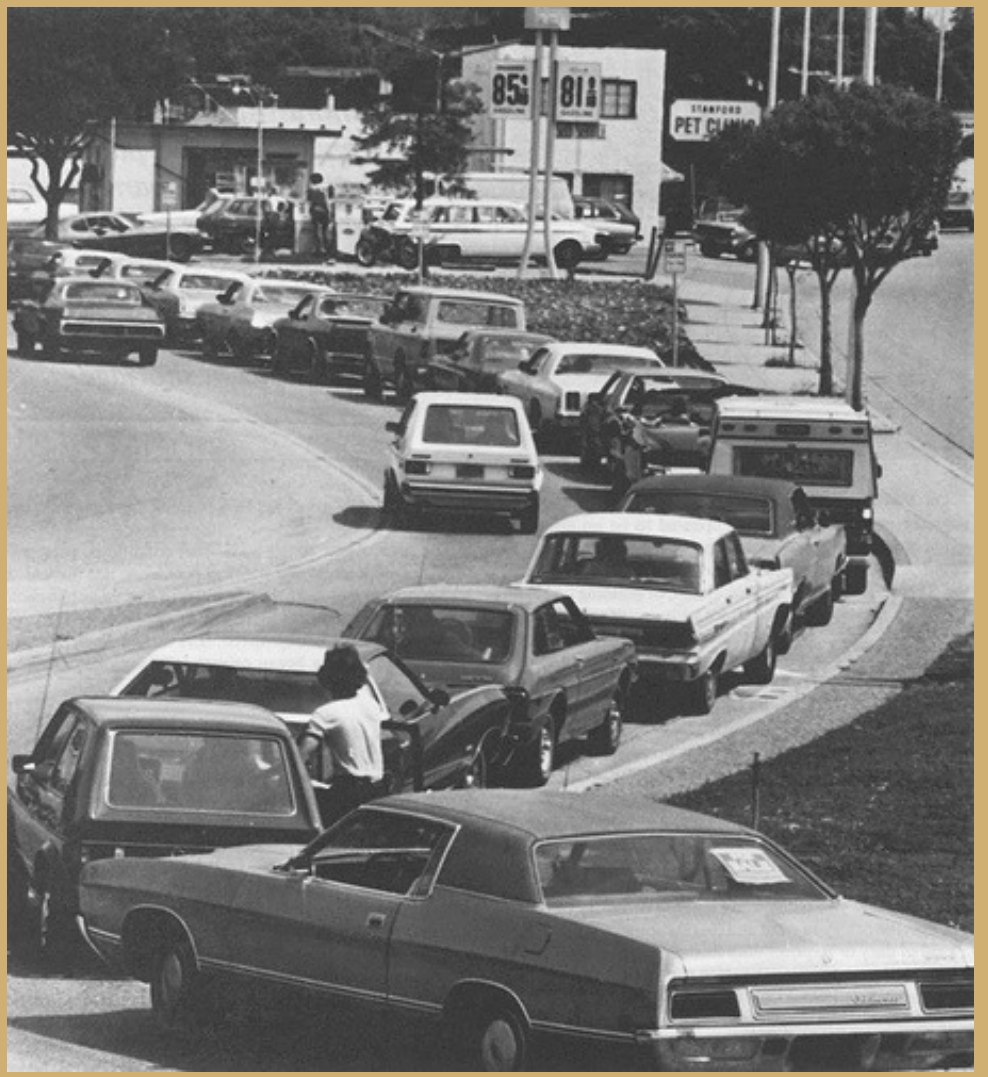
Make recommendations to the Town Council on how Falmouth can meet its obligations under the US Mayor's Climate Change Protection Agreement

Recap:
Climate Protection



Recap

Recap:
Energy Security



Recap:
Economic Prosperity

- Falmouth community sends $30 million per year out of the community on gasoline and heating oil
- US spends $564,000 per minute on imported energy

Recap:
Emissions Inventory

- TRANSPORTATION
- RESIDENTIAL:
  - HEATING OIL & ELECTRICITY
- COMMERCIAL: ELECTRICITY

85% of Maine homes rely on heating oil as the primary fuel source.

Recommendations Part I: Energy Efficiency

Recommendation #1
REAP
“Residential Energy Audit Program”

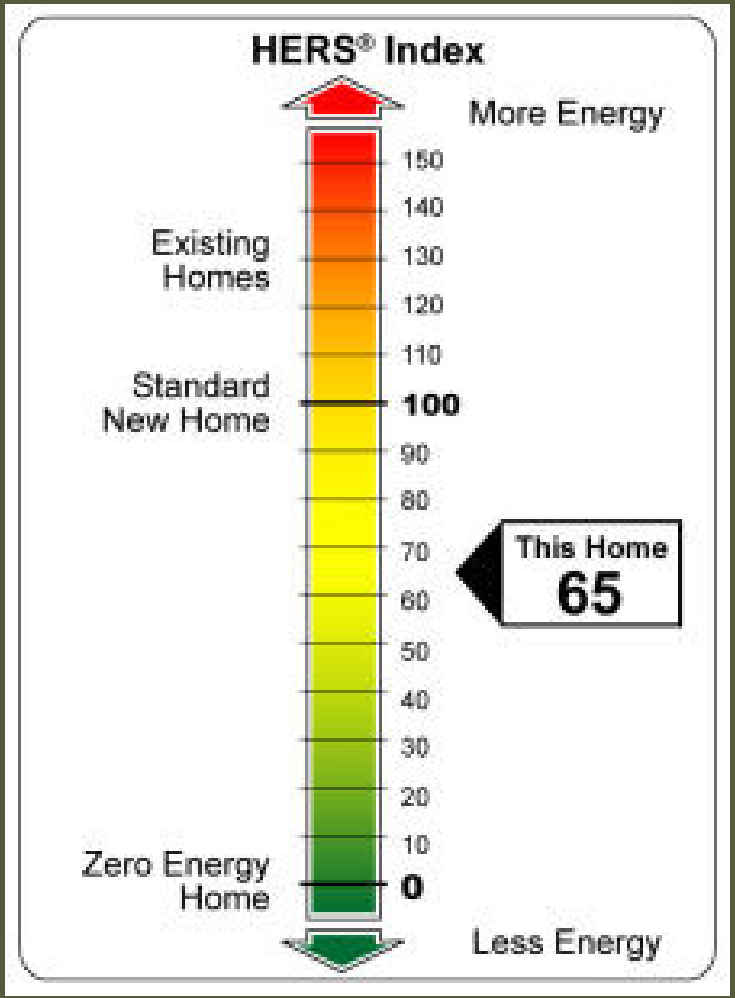
Goal is to decrease residential energy use by integrating energy efficiency into decision making

EE Recommendation #1

Recognized standard in the design and construction industry.

HERS = Home Energy Rating System ; Relative energy use index.

We want everyone to know their HERS index.



EE Recommendation #1

Each 1% decrease in HERS index =1% reduction in energy consumption, compared to the HERS reference home (= 100)

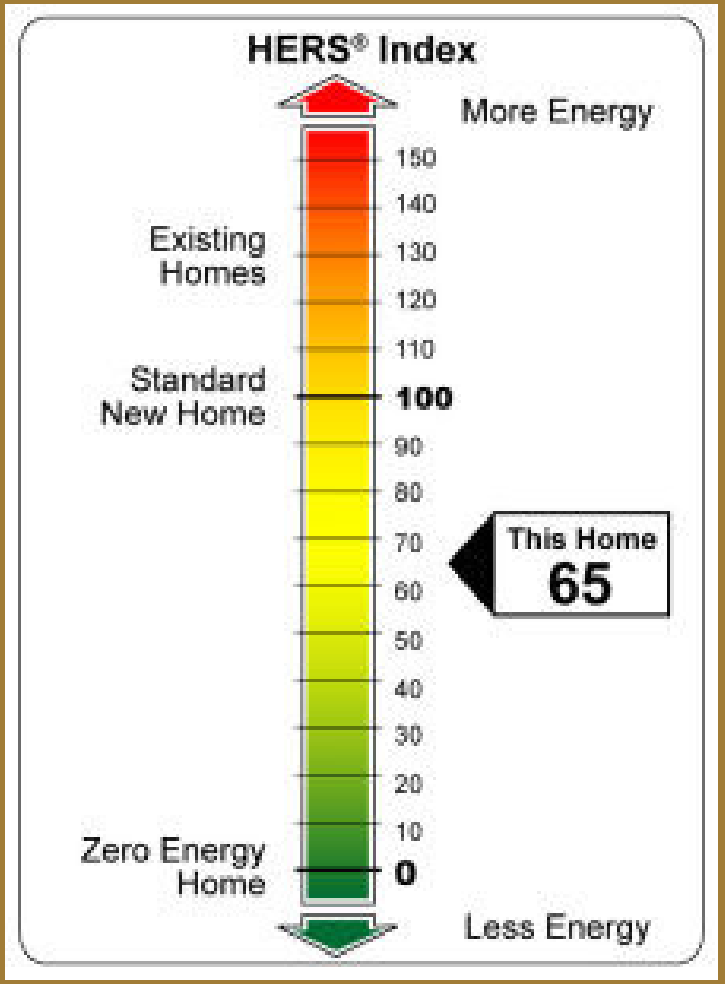
Energy Star standards require a HERS index =< 85

EE Recommendation #1

RECOMMENDATION #1
Residential Energy Audit Program

1. Require HERS index for all new home construction and major renovations.

2. Work with RE community to place HERS index on listing sheets.



Recommendation #2
Smart Meters
&
Incentive to Use Off Peak Power

Smart Meter allows both the homeowner and the utility to monitor usage in real time

EE Recommendation #2

In Home Display of Real Time Data

Reduction in Consumption ~ 10%

EE Recommendation #2

Time of Use Residential Rate

Alerts consumer to peak power condition; lower prices for off peak power

EE Recommendation #2

Smart Meter +
"Time of Use" residential rates

Reduction ~ 24 - 37%

EE Recommendation #2

RECOMMENDATION #2
Smart Meters

1. Communicate to and work with the PUC and CMP to obtain smart meters with a user friendly indoor display for Falmouth residences.

2. Petition the PUC to implement a Residential Time of Use Rate that provides an incentive for the homeowner to modify the time of their electricity consumption.

Recommendation #3
Cold Climate Heat Pump

Cold climate heat pump is a

- "refrigerator in reverse"
- powered by electricity
- uses additional compressor

EE Recommendation #3

- No emissions (depending on electricity)
- Provides both heat and A/C
- Can be used in retrofits
- Requires forced hot air system
- New technology

EE Recommendation #3

RECOMMENDATION #3
Cold Climate Heat Pump Demonstration

1. Install demonstration CCHP system in a municipal facility.
2. Document the savings in energy costs and emissions.
3. Use as educational tool for general public.

The Hallowell Acadia heat pump can operate at temperatures below 0 degrees and still perform significantly better than electric-resistance heat

Maine has the highest emissions per home in the country.

- US Dept of Energy

Recommendation #4
Property Assessed Clean Energy
“PACE”

Barriers to energy efficiency and use of renewable energy:

- Lack of Information
- Uncertainty about $$ Savings
- Upfront Costs
- May not plan on long term occupancy

EE Recommendation #4

PACE is an innovative financing program for Energy Efficiency and Renewably Energy Systems:

- ⇨voluntary
- ⇨ No upfront cost to homeowner
- ⇨ No cost to municipality
- ⇨ Payments offset by energy savings
- ⇨ Obligation remains with property (no due on sale)
- ⇨ Repayment is via special assessment on that home, paid through property tax

EE Recommendation #4

PACE SIMPLIFIED

Enabling agreement between town and capital provider.

Home qualifies, not homeowner.

Process Overview :

- Energy audit & recommended upgrades
- Homeowner decides which Investments to make
- Apply and be approved
- Town collects through property tax
- Town disperses payments to capital provider

EE Recommendation #4

States with Enabling Legislation

- California
- Colorado
- Illinois
- Louisiana
- Maryland
- Nevada
- New Mexico
- New York
- Ohio
- Oklahoma
- Oregon
- Texas
- Vermont
- Virginia
- Wisconsin

- Maine: pending

EE Recommendation #4

RECOMMENDATION #4
Property Assessed Clean Energy, or "PACE"

1. Advocate for enabling legislation at state level.
2. Implement a PACE program for residential energy efficiency upgrades & renewal energy installations.

Recommendation #5
Cool Roofs

Traditionally commercial roofs are black.

White, or “cool roofs” have been advocated by energy efficiency experts by over 20 years.

Forest Avenue Hannaford

Why? Because they can cut air conditioning costs substantially
(~ 15 – 40% of summer electric bills with minimal offset in increased heat)

If all buildings in the world had white roofs, and if all roads were white colored, it would be the equivalent of taking all the cars in the world off the roads for 11 years

- Secretary of Energy Chu

Market acceptance has driven costs down so that there is now a very small price premium for white roofs.

More recently, there is a white coating that can be applied to retrofit existing roofs.

Why aren’t all commercial roofs white (or vegetated?):

- lack of knowledge
- market failure

RECOMMENDATION #5
Cool Roofs

1. Adopt a “cool roof” ordinance which requires that all new commercial roofs be white or vegetated.
2. Require that all existing commercial roofs over a given SF be retrofitted as white or vegetated within 10 years.

EE Recommendation #4

Recommendation #6
High Performance Energy Efficient Public Buildings

Operation, heating and cooling of buildings

~ 40% of global warm emissions

&

consume over 70% of electricity

“Green Building”: designed to reduce the overall impact of the built environment on human health and the natural environment.

LEED

(Leadership in Energy and Environmental Design)

US Green Building Council

There are different levels: basic, silver, gold, platinum…

The 2030 Challenge

is an alternate standard advanced by Architecture 2030.

Without too much detail, it requires new buildings and major renovations to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 50% better than the regional (or country) average for that building type.

The fossil fuel reduction standard increases by 10% per year.

When compared to conventional buildings, green buildings:

consume 26% less energy
33% fewer greenhouse gas emissions
13% lower maintenance costs
27% high occupant satisfaction

When compared to conventional buildings, green buildings:

consume 6.6% improvement on ROI (return on investment)
8-9% reduction in operating cost
7.5% increase in building value
3.5% increase in occupancy rates

Step 1: Lead by Example and Expand the Green Building Market: set strong standards for new & retrofitted public buildings (schools, library, town hall, etc):

highly visible
leadership by example
educate citizenry about benefits and realities
catalyst for green building community wide

Examples:

Clayton MO (16,076 pop): Requires all new construction and major renovations of city owned, occupied or funded buildings over 5,000 SF to earn LEED silver.

Kearny NJ (37,295 pop) Requires all new municipal buildings to earn minimum LEED silver.

Washington State: mandates the goals of the 2030 Challenge.

Portland Maine

2009

Green building ordinance requiring all city-owned new construction and major renovations to be built to LEED Silver standards with additional energy credits to meet the energy and carbon reduction goals of the Architecture 2030 Challenge.

RECOMMENDATION #6
Required High Performance, Energy Efficient Public Buildings

Adopt ordinance that requires all new municipal buildings, including schools, be built to meet the highest feasible LEED standard and/or meet the “2030 Challenge” energy performance standards.

Recommendation #7
Change How We Heat Water

Heating domestic hot water accounts for ~ 15% of home energy use.

Alternatives to conventional hot water heaters:

Solar

On demand

Heat pump

No reason to get an oil bill in August for heating your hot water.

RECOMMENDATION #7
Change "Business as Usual" for Heating Water

1. Adopt an ordinance with respect to codes for water heaters in new construction.
2. Educate the public and the building community on energy and cost efficient ways to provide hot water.

Recommendation #8
Street and Parking Lot Lights

Street lights are on 10 -11 hours per day, 365 days per year.
Other towns have found that they can realize considerable cost savings by reducing unnecessary lights, and using more efficient lamps.

Parking lot lights share many of same attributes as street lights.

Lighting after store or business hours should be reduced to just security lighting.

RECOMMENDATION #8
Streetlights & Parking Lot Lights

1. Any new street lights or parking lot lights should incorporate the most efficient lighting technology available, and should have controls which enable more control than just sensors. (Ordinance amendment needed)
2. Remove streetlights not needed for public safety.
3. Work with CMP to replace existing lamps with more efficient and less intensive lighting. Invest in LED lighting when cost savings can justify the investment.

EE Recommendation #4

Time is of the Essence on 2 matters:

1. Letter to Maine urging passage of enabling legislation for PACE.
2. Letter to PUC and CMP requesting smart meters for Falmouth & residential Time of Use Rate with alerts for peak power usage.

What's next?

1. Council: Authorize letters of support (smart meters and PACE)
2. FGRC: Additional recommendations.