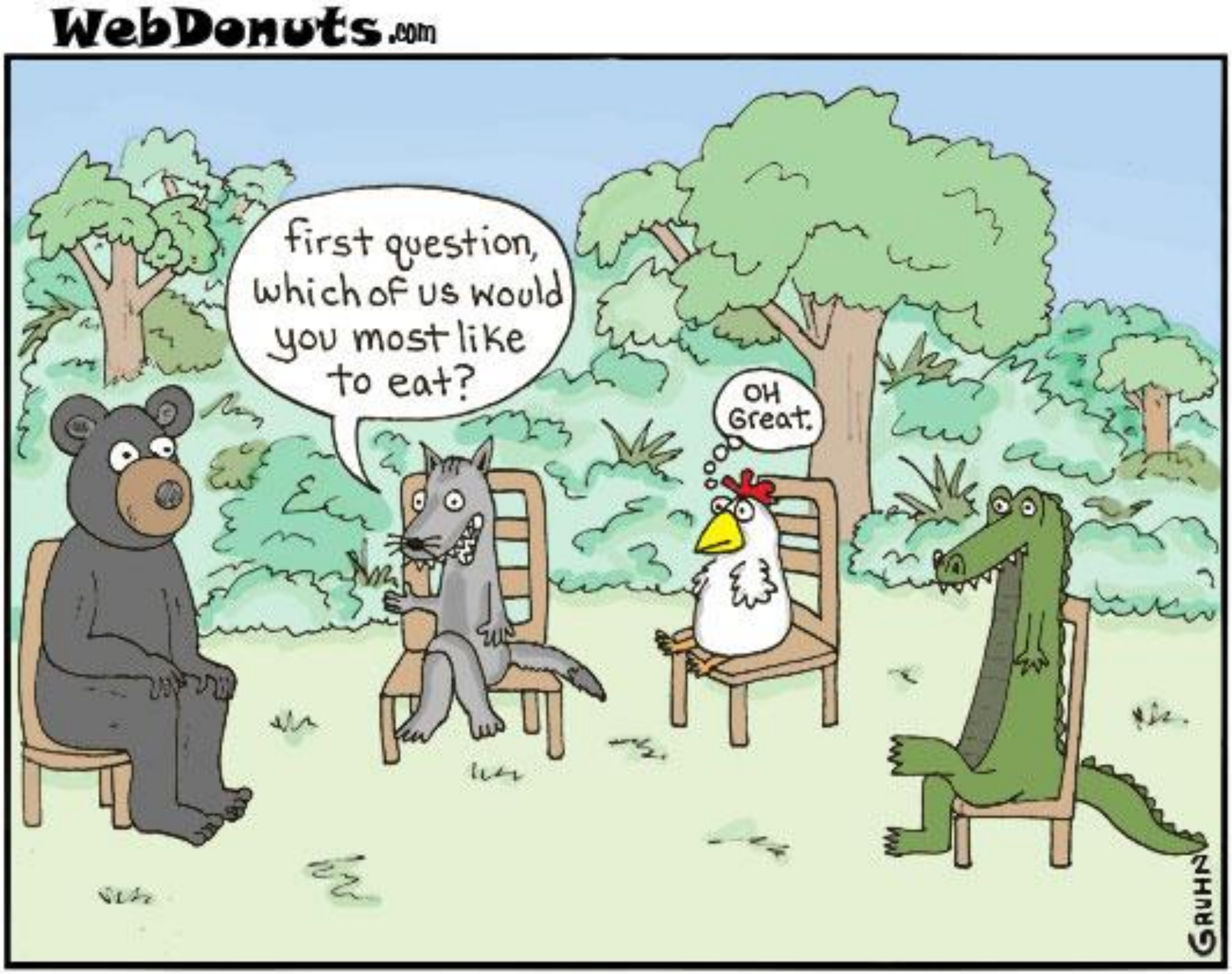
April 20, 2017

Residential Advisory Committee

Q2 2017

Portland, OR

Welcome!



Ice breakers in the wild

Pick one….

- What mundane super power would you like to have?
- What's the best thing that's happened to you this last week?
- What's on your bucket list for this year?

Our Guiding Principles

- We engage in respectful communication
- We are open to each other’s ideas and perspectives
- We value and capitalize on differences to create innovative solutions for the region
- We are accountable, participate, provide feedback, and collaborate to the benefit of all parties
- We are responsive and follow-through in a timely manner

Updated Lifecycle Graphic

Agenda

10:00 – 10:15	Welcome and Introductions	Lis Saunders
10:15 – 10:30	Housekeeping	Lis Saunders
10:30 – 11:45	Work Group discussion	All
11:45 – 12:15	LUNCH (provided)	
12:30 -12:30	Residential/Mass Markets Portfolio Update • Window Attachments • Heat Pump Water Heaters	Jeff Mitchell Neil Grigsby Jill Reynolds
12:30 – 1:15	Residential/Mass Markets Portfolio Update • DHPs: Cost Containment	Suzi Asmus
1:15 – 2:00	Residential/Mass Markets Portfolio Update • Manufactured Homes: Program Design discussion	Neil Grigsby
2:00 – 2:15	BREAK	
2:15 – 3:30	Utility Share Outs/Round Robin	All
3:30 – 3:40	Opportunity for Public Comment	
3:40 – 4:00	Wrap Up/Adjourn	All

Housekeeping

- Follow up on action items from January 19, 2017
- RAC Workplan

Red text indicates updates since last quarter

Q3 2016 July 21	Q4 2016 Oct 6	Q1 2017	Q2 2017
PORTFOLIO REVIEW			
ILC/Portfolio Review	ILC/Portfolio Review	ILC/Portfolio Review	ILC/Portfolio Review
RESIDENTIAL PROGRAM REVIEWS			
Dryers (Product Readiness Approval review)	-		HPWH - Annual Review
RPP Retail Platform	-		Manufactured Homes
MARKET STRATEGIES			
Consumer Products Regional Market Strategy Collaborative - update			
ANNUAL OPERATIONS PLANNING			
2017 Ops Plan - RAC input/direction for 2017	2017 Ops Plan update on process. Review/input for RPAC/Board.	2017 Ops Plan - final	
EMERGING TECH			
~~UHD TV Technology Trends~~	Sanden pilot (WSU/BPA) Split System Water Heater		
CODES & STANDARDS			
GOVERNANCE/OTHER			
2016 Workplan update	2016 Workplan update	2017 Workplan Update	2016 Workplan update
RAC Utility Round Robin	RAC Utility Round Robin	RAC Utility Round Robin	RAC Utility Round Robin
		Annual RAC Charter Review	
		Annual Program Work Group membership review	
MISC TOPICS			
EStar partner meeting coordination	BPA's planned evaluation in the res sector		
Data Analytics discussion			
Residential Building Stock Assessment Update			

Housekeeping

- Follow up on action items from January 19, 2016
- RAC Workplan
- 2017 Meeting Locations

Location Location Location

Meeting	**Location**	**Proposed Date**
Q1 Residential Advisory Committee	Puget Sound area	Thursday, January 19
Q2 Residential Advisory Committee	Portland, OR	Thursday, April 20
Q3 Residential Advisory Committee	~~Portland/Vancouver~~ *Puget Sound area?*	Thursday, August 10
Q4 Residential Advisory Committee	Wenatchee, WA (Chelan PUD)	Thursday, October 12

Housekeeping

- Follow up on action items from January 19, 2016
- RAC Workplan
- 2017 meeting dates and locations

Packet/Informational Updates

- Appendices

RBSA Quarterly Update Webinars

11:00 am to Noon

- June 15
- September 13

Q2 RAC Meeting (4/20)

Workgroups Discussion

A facilitated discussion



Why Are We Here?

Format Review

What to Expect

- 4 discussion rounds, 5 minutes each
- Write, doodle, draw thoughts, ideas and questions on *placemats at tables*
- After each round, *table host* stays, others move to new *tables*, carrying *placemats,* new ideas, and questions to next conversation.

Café Etiquette

- Focus on what matters
- Contribute your thinking
- Speak your mind and heart
- Listen to understand
- Link and connect ideas
- Listen together for insights and deeper questions

Breakout Discussion 1:

How would you define the purpose of a NEEA workgroup?

5-minutes remaining

How would you define the purpose of a NEEA workgroup?

4-minutes remaining

How would you define the purpose of a NEEA workgroup?

3-minutes remaining

How would you define the purpose of a NEEA workgroup?

2-minutes remaining

How would you define the purpose of a NEEA workgroup?

1-minutes remaining

How would you define the purpose of a NEEA workgroup?

Question 1: Share-out

Breakout Discussion Question 2:

What value do you get from participating in work groups?

5-minutes remaining

What value do you get from participating in work groups?

4-minutes remaining

What value do you get from participating in work groups?

3-minutes remaining

What value do you get from participating in work groups?

2-minutes remaining

What value do you get from participating in work groups?

1-minutes remaining

What value do you get from participating in work groups?

Question 2: Share-out

Breakout Discussion Question 3:

What is the role of a work group member?

5-minutes remaining

What is the role of a work group member?

4-minutes remaining

What is the role of a work group member?

3-minutes remaining

What is the role of a work group member?

2-minutes remaining

What is the role of a work group member?

1-minutes remaining

What is the role of a work group member?

Question 3: Share-out

Breakout Discussion Question 4:

What opportunity do you see for greater collaboration at the work group level?

5-minutes remaining

What opportunity do you see for greater collaboration at the work group level?

4-minutes remaining

What opportunity do you see for greater collaboration at the work group level?

3-minutes remaining

What opportunity do you see for greater collaboration at the work group level?

2-minutes remaining

What opportunity do you see for greater collaboration at the work group level?

1-minutes remaining

What opportunity do you see for greater collaboration at the work group level?

Question 4: Share-out

Wrap Up Discussion

30 min

LUNCH BREAK

Residential/ Mass Markets Portfolio

- Heat Pump Water Heaters
- Ductless Heat Pumps
- Retail Product Portfolio
- Super-Efficient Dryers
- Residential New Construction
- Manufactured Homes

NEEA Portfolio Overview: 20 Year View

Portfolio Status as of March 2017

Planned Q2'17 Advancements

	concept development		program development		market deployment		
	SCANNING & CONCEPT IDENTIFICATION	CONCEPT OPPORTUNITY ASSESSMENT	MARKET & PRODUCT ASSESSMENT	STRATEGY TESTING & FINALIZATION	MARKET DEVELOPMENT	LONG-TERM MONITORING	20 year Total Regional Savings Potential (aMW)
Consumer Products	Heat Pump Water Heater Split System Residential Window Attachments			Retail Product Portfolio Super Efficient Dryers	Heat Pump Water Heaters Ductless Heat Pumps Codes & Stds	TVs Residential CFLs White Goods	1000-1400
New Construction (Commercial & Residential)			Manufactured Homes Commercial Codes Enhancement	Next Step Home	Codes & Stds *Integrated Design Lab infrastructure*	Efficient Homes	400-600
Commercial Lighting			Luminaire Level Lighting Control		Reduced Wattage Lamp Repl. Codes & Stds *Top Tier Trade Ally infrastructure (opt.)*		100-150
Other Markets	Air Nozzle Industrial Motor Product Labeling		Commercial Window Attachments	RETA CRES Refrigeration Operator Cert.	BldgOp Cert Exp Codes & Stds *Ind. Tech. Training infrastructure (opt.)* *Comm Real Estate infrastructure (opt.)* *Comm & Ind. SEM infrastructure*	Food Processors Drive Power, BldgOp Cert, Commissioning, 80Plus	100-300

Window Attachments

Neil Grigsby

Split System HPWH

Jill Reynolds

DHP Cost Containment

Suzi Asmus

A Tale of DHPs

A Tale of DHPs

Consumer Experience

ADU

- 800 sq. Ft
- 18k BTU
- 1:1
- $4900

Second Floor

- 360 sq. Ft
- 12k BTU
- 1:1
- $3900

Parents' Condo

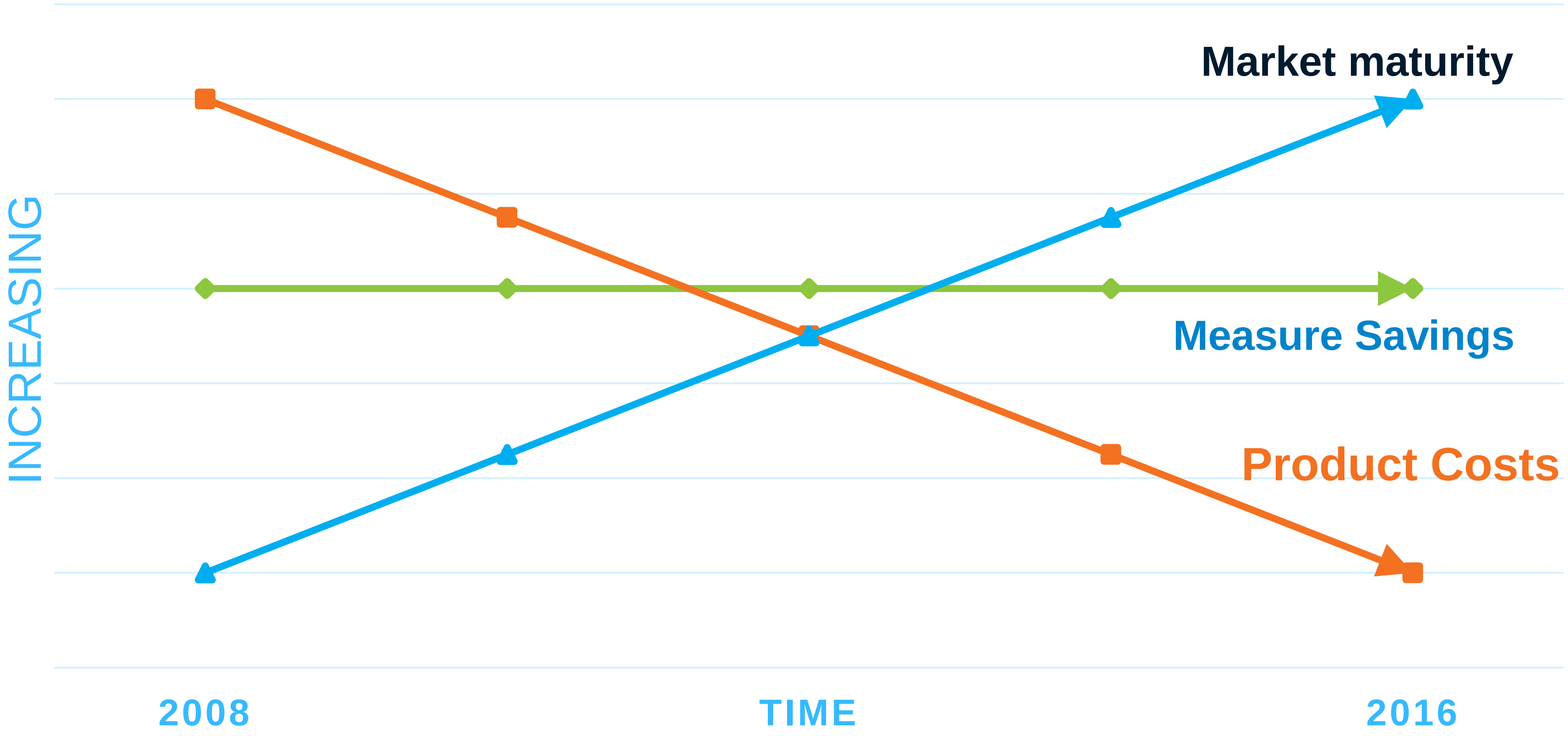
- 969 sq. Ft
- 12k BTU
- 1:1
- $3900

Cost Containment: Goals

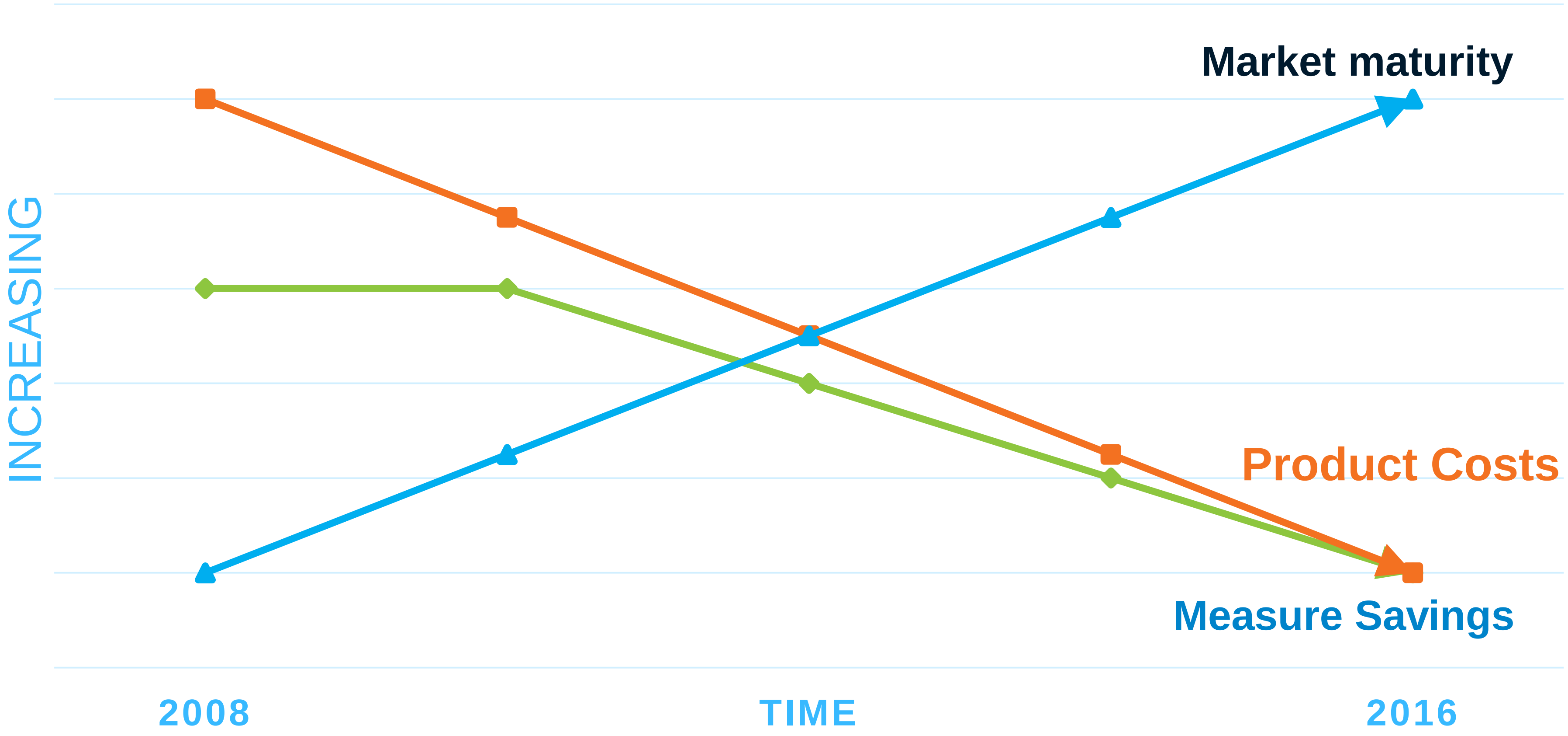
- Drive average costs down to protect cost-effectiveness
- Bring more affordable units into the market to keep DHPs accessible to lower-income homeowners

Cost Containment – Why?

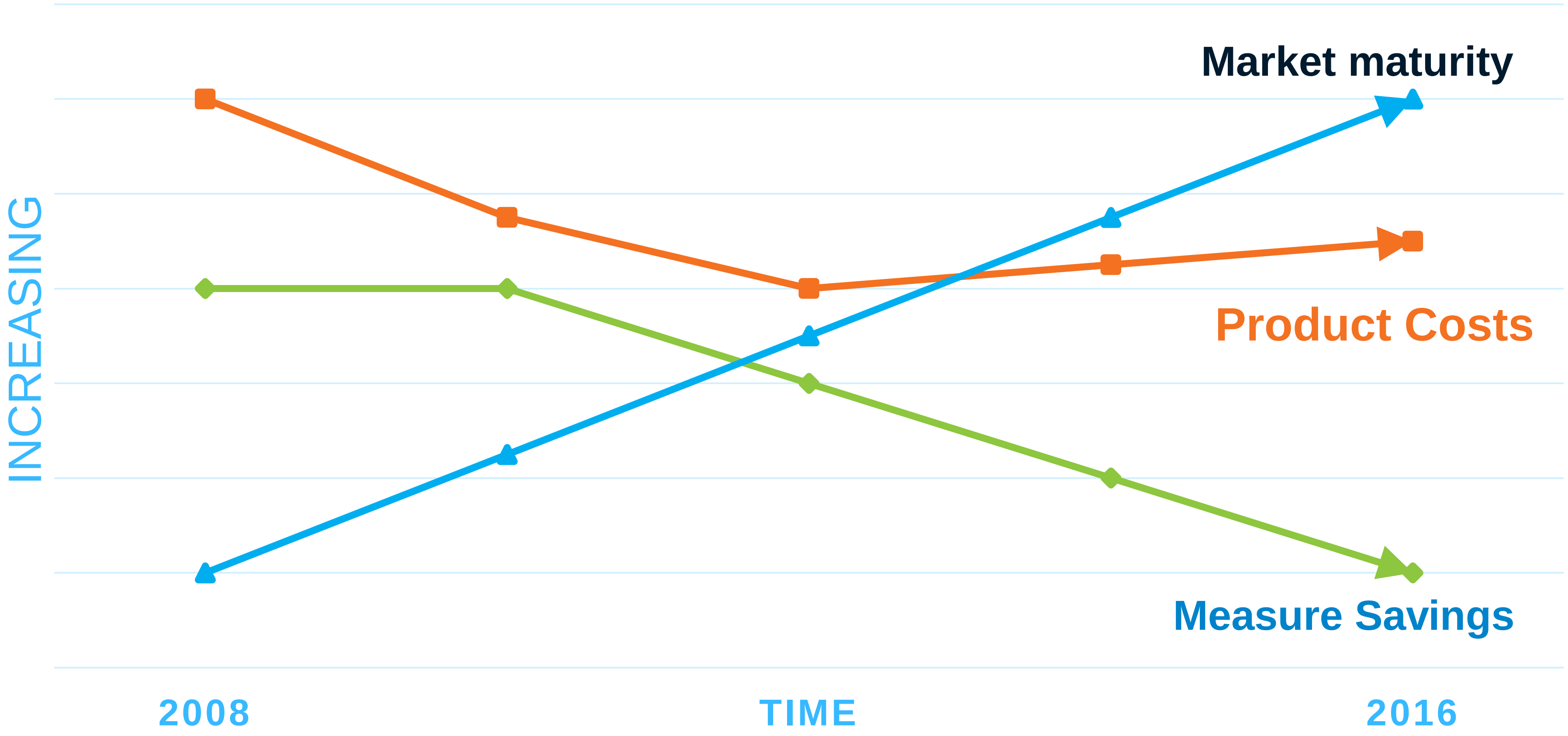
What we expected to happen



What happened



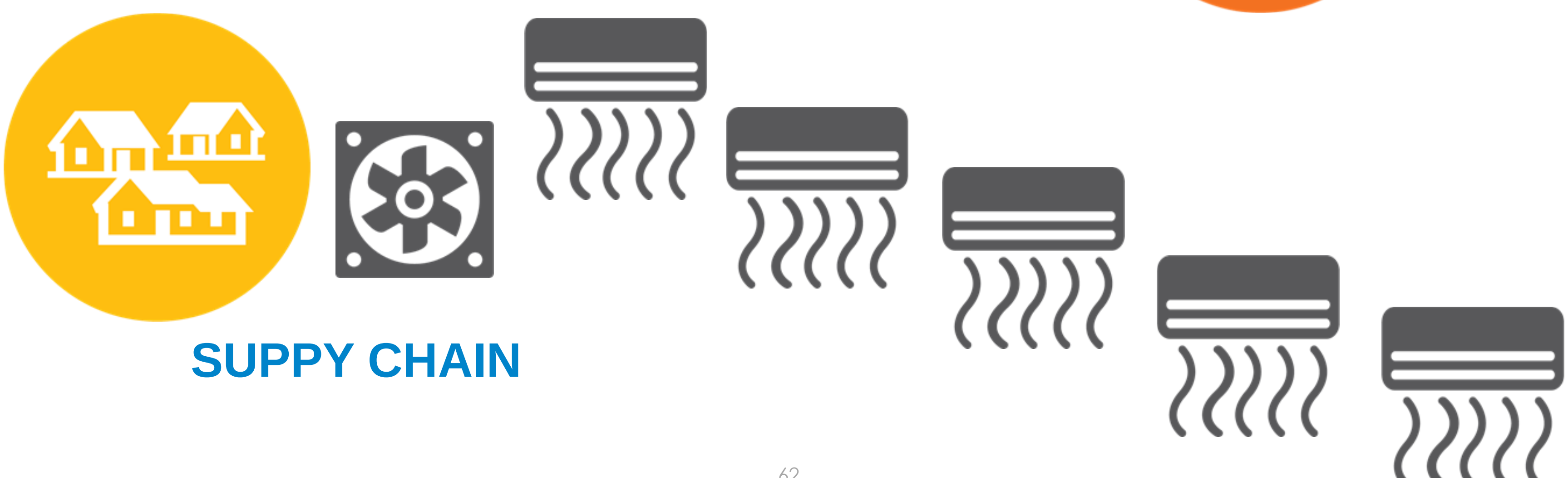
What happened



Other Market Challenges

COST EFFECTIVENESS

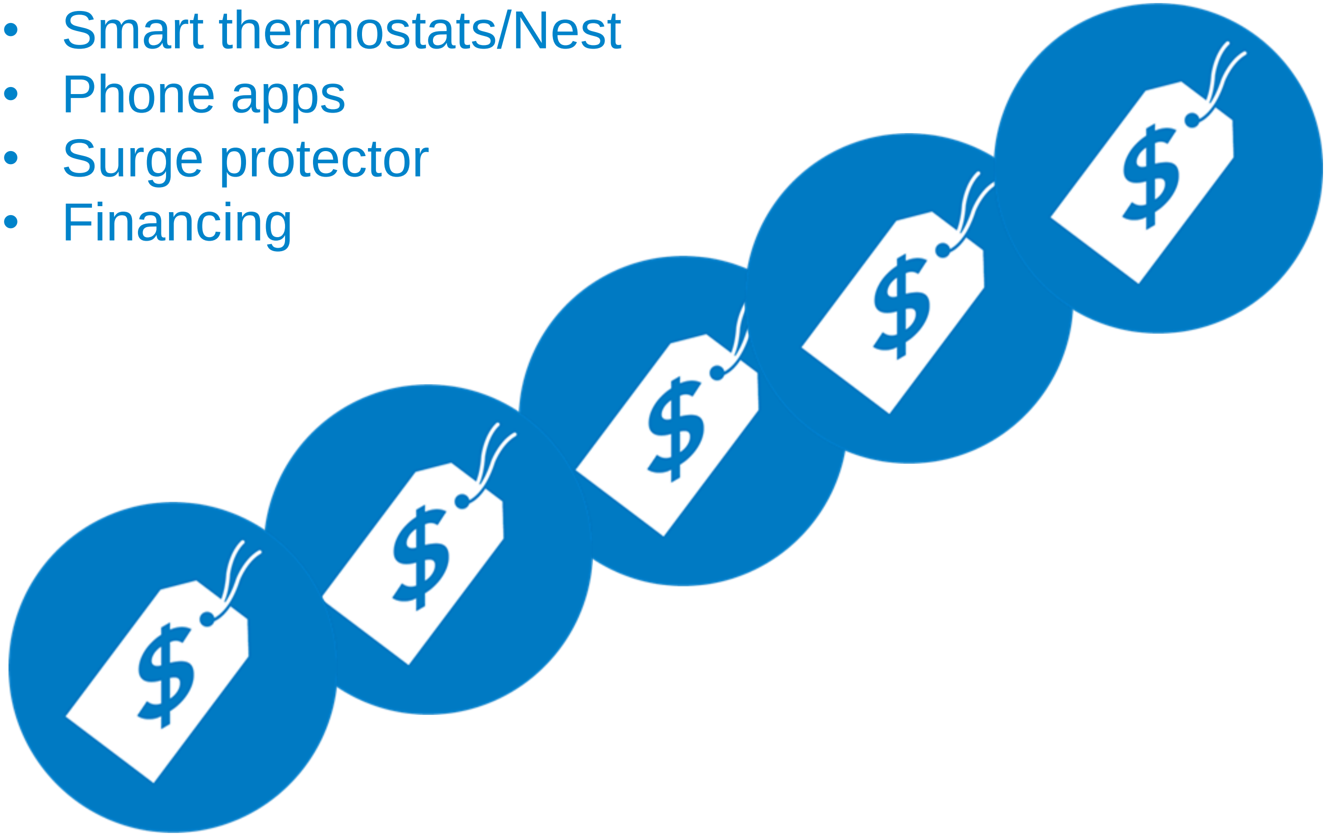
TARGET MARKET



SUPPY CHAIN

Market Trends

- "System enhancements"
  - Cold climate systems
  - Smart thermostats/Nest
  - Phone apps
  - Surge protector
  - Financing



What have we been working on to address this?

International Market Scanning

Financing Research

Build Business Cohort

DIY/Quick Connect

Bringing Promotions to Market

Increase Market Competition

Looking into the data for other options

What we looked at

Findings

Impacts to Cost

- Single-zone (1:1) vs. Multi-zone
- Size of system
- HSPF

Cost of 1:1 Declining – Multi-zone Increasing

Average cost by year and type

DHP Type	2012	2013	2014	2015	2016	Percent +/ - 2012-2016	n
1:1 Models	$4,738	$4,548	$4,496	$4,432	$4,488	-5.3%	4,778
Multi-Zone Models	$7,716	$7,863	$7,473	$8,026	$8,046	4.3%	3,338
All Models	**$5,852**	**$5,832**	**$5,838**	**$5,834**	**$6,100**	**4.2%**	**8,116**

- *All dollar amounts were normalized to 2016 dollars.*
- *Sales taxes were removed from the total cost.*

Single-zone shrinking as % of Rebated Installs

Year	# of Utilities	# of Rebates Processed	1:1	1:2	1:3	1:4	2:2	Other
2013	27	1,850	62.3% (1,152)	24.7% (457)	7.5% (139)	1.8% (34)	2.4% (44)	1.3% (24)
2014	24	1,590	60.0% (955)	23.1% (368)	9.0% (144)	3.4% (54)	2.7% (43)	1.6% (25)
2015	22	1,715	61.2% (1,050)	23.6% (404)	8.8% (151)	3.5% (60)	1.3% (23)	1.5% (26)
2016	21	2,078	54.2% (1,126)	26.2% (545)	11.9% (252)	4.6% (95)	0.9% (18)	2.2% (31)

- *All dollar amounts were normalized to 2016 dollars.*
- *Sales taxes were removed from the total cost.*

Size Influences Cost

Average cost by year and system size

For 1:1 replacements only

Nominal Capacity	2012	2013	2014	2015	2016	Percent +/ - 2012-2016	n
9-15k BTU	$4,300	$4,086	$4,048	$3,937	$4,034	-6.2%	1,254
15-21k BTU	$4,756	$4,630	$4,570	$4,550	$4,544	-4.5%	2,645
21-30k BTU	$5,100	$5,039	$4,915	$4,858	$5,099	0.0%	849
30k+ BTU	$5,732	$5,728	$4,965		$6,000	4.7%	31
Total	**$4,738**	**$4,548**	**$4,496**	**$4,432**	**$4,488**	**-5.3%**	**4,779**

- *All dollar amounts were normalized to 2016 dollars.*
- *Sales taxes were removed from the total cost.*

Highest HSPF = Highest Cost

Average cost by HSPF

Nominal Capacity	HSPF Range	2012	2013	2014	2015	2016	Percent Increase/ Decrease 2012-2016	n
9-15k	HSPF 9.0 -11.0	$3,865	$3,988	$3,846	$3,878	$3,665	-5.2%	425
	HSPF 11.1 - 12.5			$3,882	$3,908	$4,234	9.1%	201
	HSPF 12.6+			$4,005	$4,189	$4,648	16.1%	21
15-21k	HSPF 9.0 -11.0	$4,550	$4,577	$4,567	$4,696	$4,295	-5.6%	854
	HSPF 11.1 - 12.5			$4,315	$4,583	$4,678	8.4%	454

- *Sample=Mitsubishi Models only*

Lower Costs are Achievable

Utility	System Cost
IOU 1	$ 4,030
IOU 2	$ 4,267
PUD Urban 1	$ 3,942
PUD Urban 2	$ 4,052
PUD Rural 1	$ 3,807
PUD Rural 2	$ 3,601
Regional Average	$ 4,010
Efficiency Maine	$ 3,400
Tacoma Power	$ 3,500
Quick Connect Study*	$ 2,700

- *2016 Program Costs for 12-15k Systems*

Opportunities

- PROGRAM DESIGN OPPORTUNITIES
  - Preference to systems to 1:1
  - Preference capacity to nominal 9-15k BTU systems
  - Focus rebates on HSPF 9.0-11.0
- REGIONAL PRICING RFP

Thank you!

Suzi Asmus

TOGETHER We Are Transforming the Northwest

Manufactured Homes – program design

Neil Grigsby

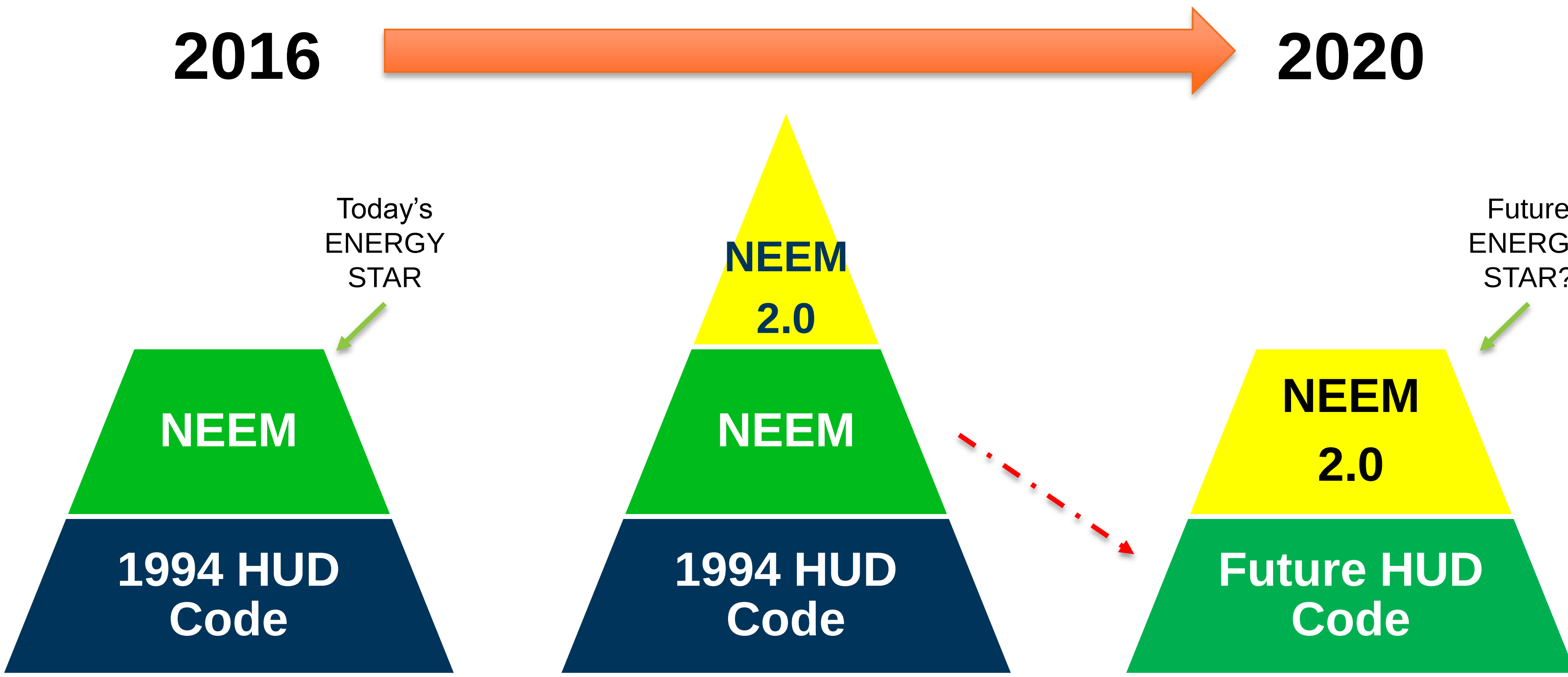
Christopher Dymond

Project Concept

Upgrade NEEM prior to HUD code change

Improve demand for efficient manufactured homes

Influence EPA's "ENERGY STAR" Program requirements



55% NEEM v1

40% NEEM v1
10-20% NEEM v2

40+% NEEM v2

MH Update – Q1 2017

- 4 Factories with signed NEEM 2.0 MOUs
  - GM of Golden West resigned in January
- NEEM 2.0 Demos
  - Fleetwood of Oregon has built 2
  - Busy winter and lots of snow, kept factories very busy
- Market Research
  - Customer Journey interviews in ID, MT, and WA
- Utility Savings Measures
  - RTF completed NEEM 2.0 w/ and w/o HP
  - NEEM 2.0 into October 2017 IM

MH Update – Q2 2017 Activities

- Demo Homes (estimated build date - 2 homes each)
  - Marlette — April or May
  - Kit Homes — April
  - Palm Harbor — May or June
- Market Research
  - Concept Testing — April
- Marketing
  - Draft Materials — June
- Utility Engagement
  - RAC — April 20th
  - EFX Session on MH — May 9th @ 11AM

Market Changes

- Federal Standard is delayed
  - We assume at least 5 years
- Manufacturers are very busy
  - More difficult to get their willing participation
- Recent Market Condition Discoveries
  - Naturally bifurcated market
  - ENERGY STAR brand value
- RTF Savings are substantially reduced

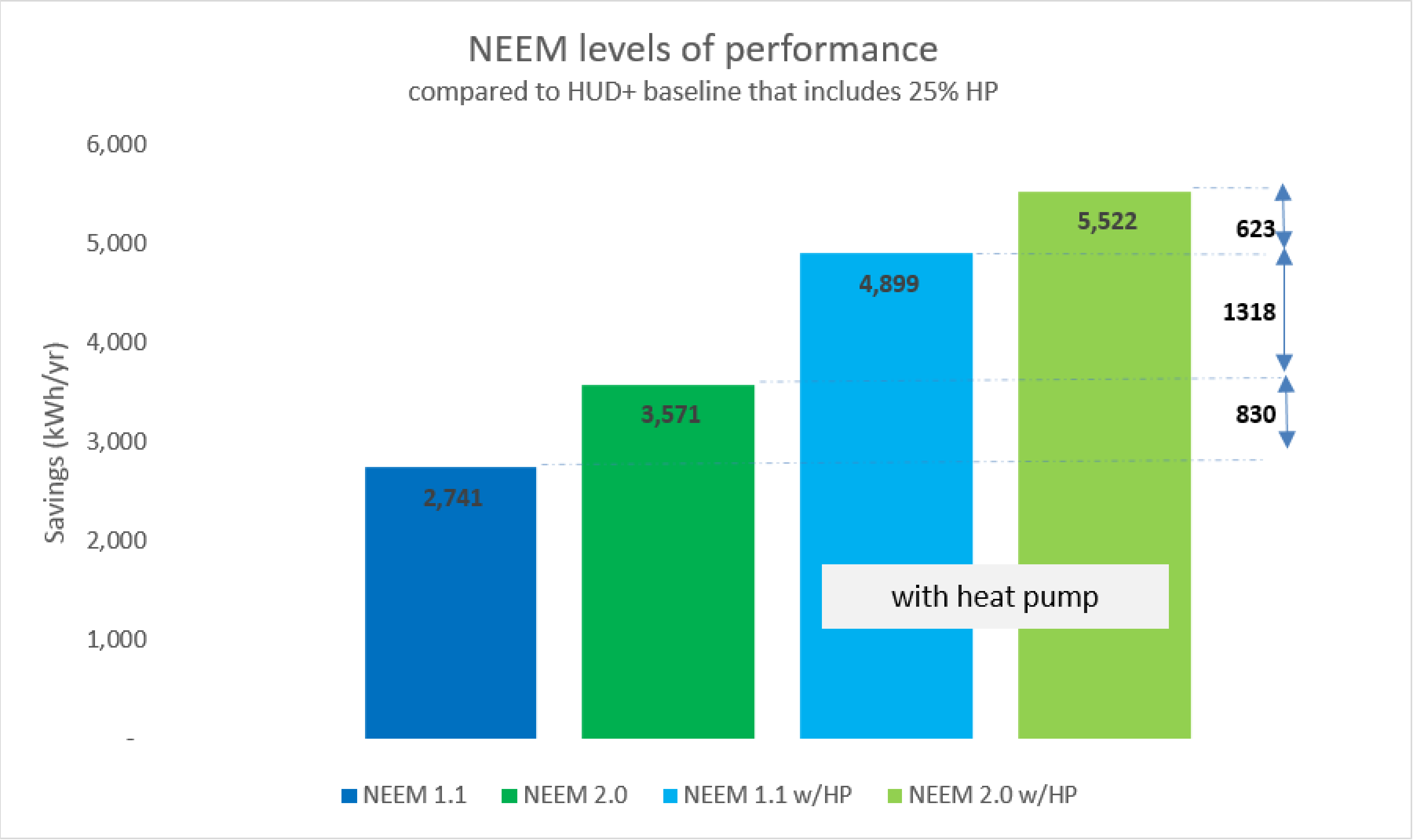
Where did the Savings Go?

- NEEM 2.0 RTF vs Ecotope Estimates
  - Putting 25% HP in the baseline -100 kWh/yr
  - Updating lighting baseline -600 kWh/yr
  - Ventilation calculation error -100 kWh/yr

(Approximate values)

- The Good News – because 25% HP is in the baseline, any new home with a heat pump can now be counted, not just incremental to current practice.

NEEM Family



Heat pump values may change 4/21/17 when RTF defines NEEM w/HP measures

Risks to MH Program

- NEEA
  - Savings dropped from ~7aMW to ~ 4aMW
  - Delay in Code Change Savings
- NEEM Program
  - Lots of hustle, for very little kWh
  - Reputation at risk
- Manufacturers
  - Less motivated
- Utilities
  - Negative impact on NEEM 2.0 savings targets

Strategy Pivot

Option A

A. Continue support for current ENERGY STAR (NEEM 1.1)
- Add enhancement packages:

Package	Benefit	Risk
NEEM 2.0 Spec	• Preps market for NEEM 2.0 • Feeds pipeline of future utility programs • Reduced NEEA incentive budget	• Lower manufacturer participation
Heat Pump	• Focuses NEEA support on DHPs at the time of sale • Energy Savings • Leverages DHP program	• Low homebuyer uptake
HPWH/Zero Energy Ready?	TBD	TBD

Regional Impacts

NEEA:

- Eliminates upstream incentive budget
- Focuses on supporting retailers with marketing material to communicate the benefits of energy efficiency.
- Low uptake of NEEM 2.0

Utilities:

- Continued support for NEEM 1.1 and NEEM 2.0
- Offer new heat pump incentive at time of purchase
- Support marketing strategy, messaging, and collateral

Option B

B. Reduce Support until new Federal Standard

- Redirect 2017/2018 budget
- Finish demonstration homes and marketing strategy

Benefit	Risks
Redirect 2017/2018 budget	Relationships with Manufacturers
NEEM 1.1 continues exists for utilities	Difficult to re-engage during next HUD code change
Demonstration homes provide manufacturers with experience	Negative impact on savings targets
Increased Retailer/Consumer awareness on the benefits of energy efficiency	No pipeline for future utility programs

Regional Impact

NEEA:

- Minimal budget to support continuation of demonstration homes, marketing strategy development and retailer outreach.
- Focuses on supporting retailers with marketing material to communicate the benefits of energy efficiency.
- No uptake of NEEM 2.0

Utilities:

- Continued support for NEEM 1.1
- Offer new heat pump incentive at time of purchase
- Support marketing strategy, messaging, and collateral

Discussion

Thank you!

Neil Grigsby

Christopher Dymond

TOGETHER We Are Transforming the Northwest

15 min

BREAK

Special Thanks

- Nancy Oakley, Tacoma Power

Utility Share-outs/Round Robin

Suggestions……

- News/updates from your organization (since our January meeting)
- Updates from those participating on the Consumer Products regional market strategy steering committee and work groups

Meeting Wrap-up

- Public Comment

- Feedback on the meeting :
  - Overall (thumbs up)
    - Agenda
    - Slides
    - Packet materials
  - What inspired you?
  - What could be improved upon?

Until we meet again…….

August 10, 2017
Puget Sound area (Seatac?)