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Priming the Pump on the ccASHP Market

Achieving the Potential for ccASHPs in Minnesota

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CEE's field research results

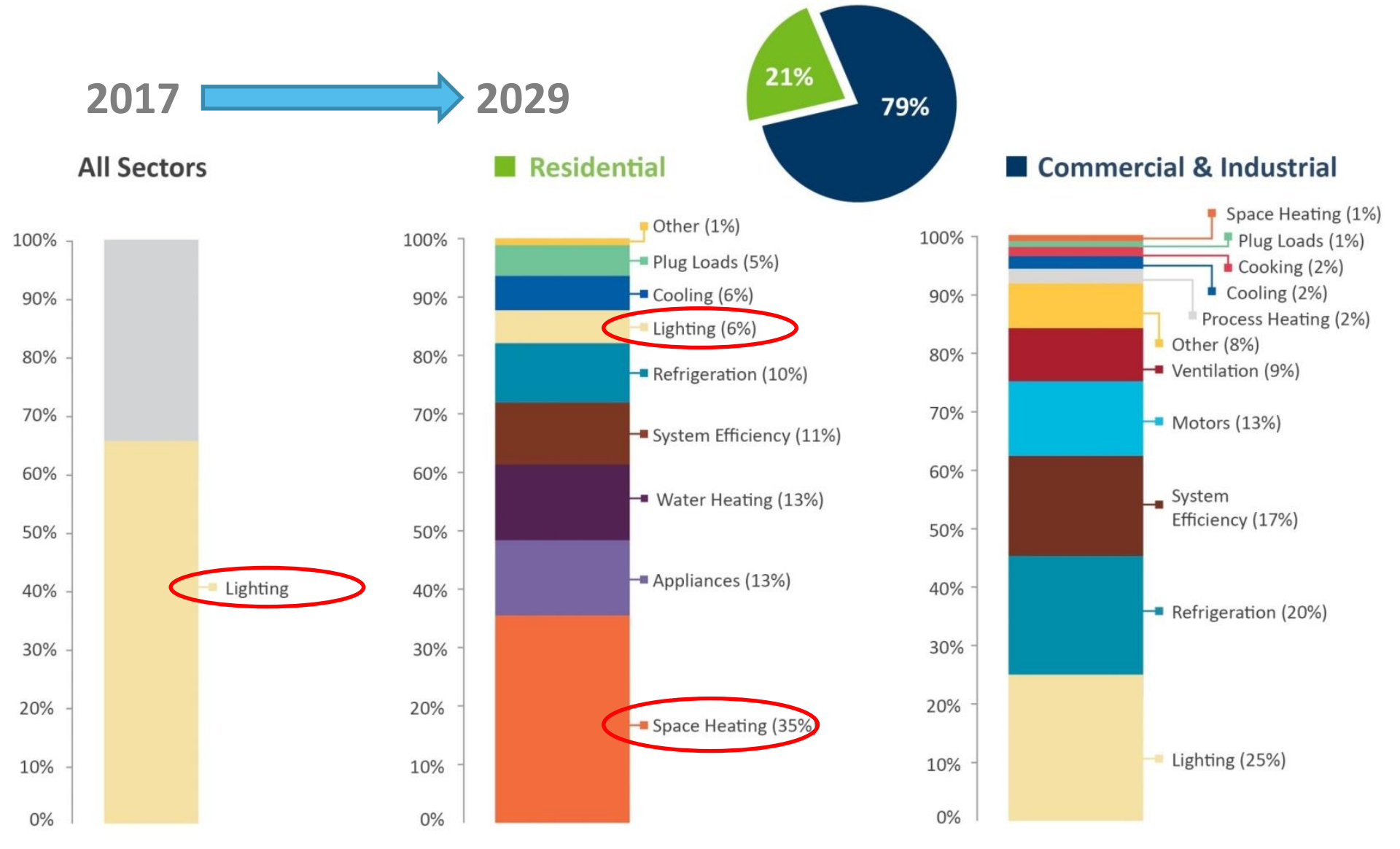
✓Significant savings for replacing propane and electric resistance

Percentage Reductions for ccASHPs				
	Site Energy	Source Energy	Homeowner Cost	Emissions
Dual fuel ASHP vs Prop. Furn.	40%	10%	30%	5%
All elect. ducted & ductless vs elect. resistance	55%	55%	55%	55%

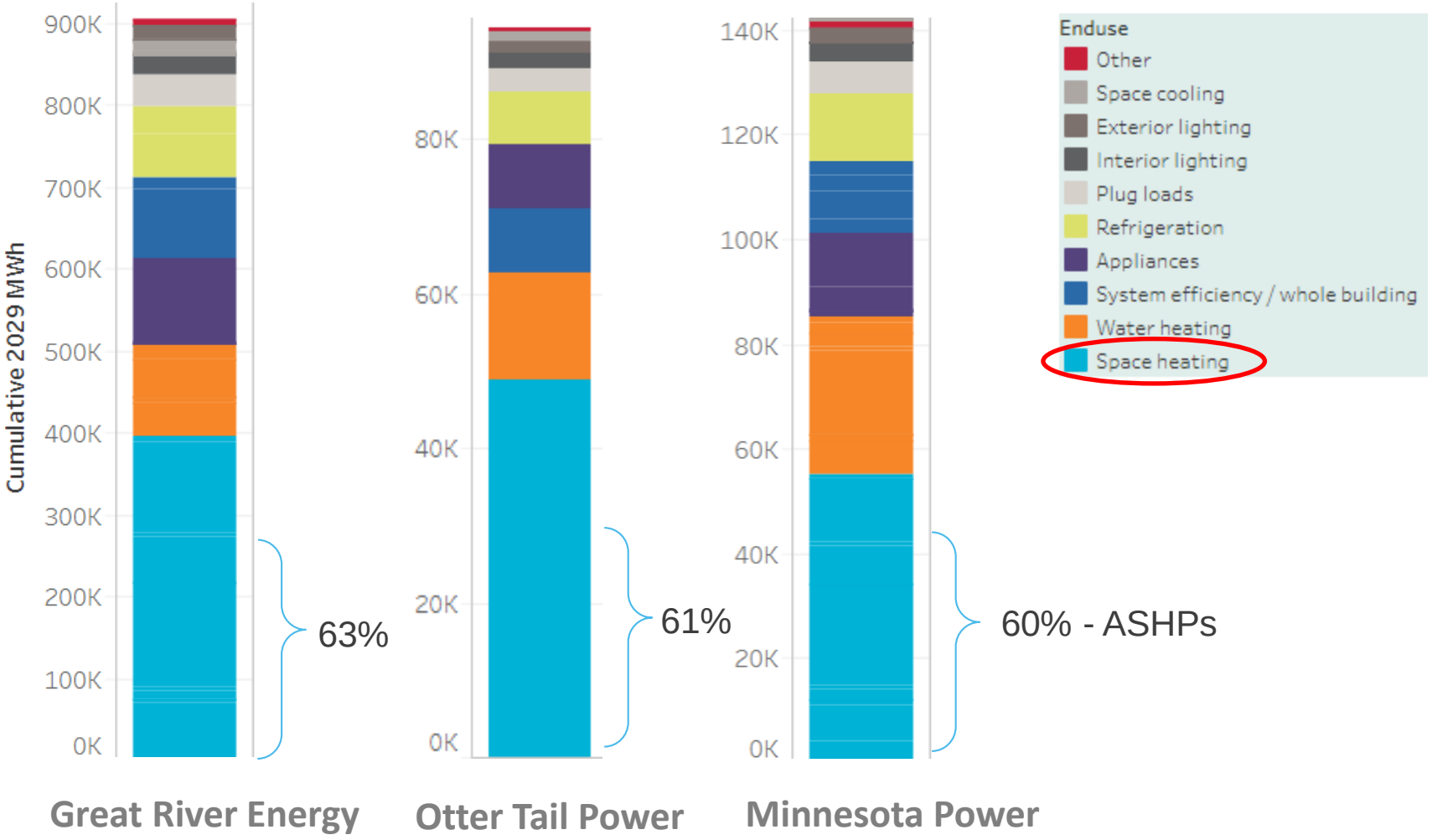
✓Technology continues to improve

- New generation systems can operate as low as -20° (efficiently as low as -13)

Minnesota Statewide Electric Savings Potential 2020-29



Large ASHP potential for utilities



Summary of MN Savings Potential

- ASHPs are the single largest electric savings opportunity
- Utility programs and rebates will shift from lighting to ASHPs
- Minnesota has 335,000 households with electric heat
  - Over 153,000 single-family homes
- Over 250,000 single-family homes with propane heat

Current ASHP Market Barriers

- ✓Low contractor adoption
  - Different system types and options
  - Change over set point
- ✓High first cost for installs
  - Low volume lead to higher install prices
  - Contractors coach customers away from ccASHPs
- ✓Limited consumer awareness and knowledge
  - Don’t understand that ASHPs are effective at heating and cooling
  - Don’t understand controls – how and when to use ASHP
- ✓Installations need to be optimized to achieve energy savings

Installation barriers: what technology is best?

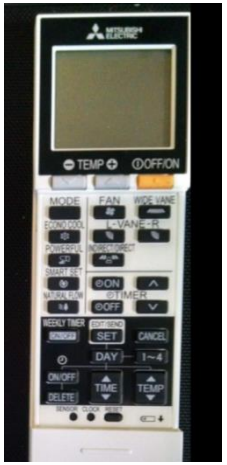
Ducted dual fuel

Ducted electric

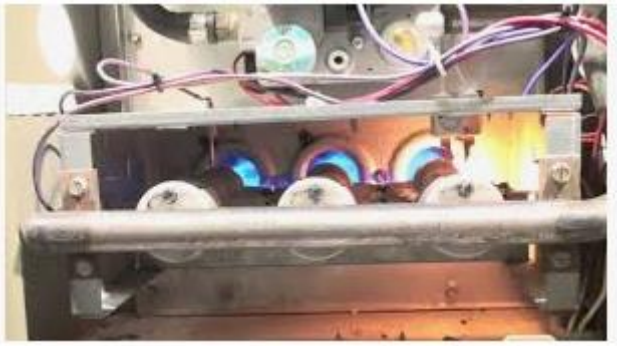
Ductless

Installation barriers: difficulty with quality installs

Control and operation



Integration with backup



Sizing needs

Result - savings are left on the table

Missed opportunity

- ✓ System sized for only AC load
- ✓ Incorrect change over temperature, so only percentage of heating load is met:
  - 10 F change pnt ~ 77%
  - 20 F change pnt ~ 60%
  - 30 F change pnt ~ 30%
- ✓ Electric resistance still used for primary heating

Solutions

- ✓ Rule of thumb: increase HP by one ton to size for heating
- ✓ HP performs as specified: follow best practices for change over temperature
- ✓ Explain system benefits, savings, and controls to homeowner

How Do We Achieve ASHP Savings Potential?

Utility Rebates

Utility	ASHP Rebate	Requirements
Minnesota Power	Ductless - $500 Ducted ccASHP - $1,000	SEER 15 and HSPF 8.5 SEER 18 and HSPF 10
Otter Tail Power	ASHP - $400 per ton ccASHP - $600 per ton	SEER 15 and HSPF 8.5 SEER 15 and HSPF 10
Great River Energy	$480 – $630	SEER 14.5 SEER 16
Missouri River Energy Services	ASHP - $250 ccASHP - $350	SEER 15 and HSPF 8.5 SEER 18 and HSPF 9.5
Southern Minnesota Municipal Power Agency	$100 + $25 per SEER >14.5 $200 + $25 per SEER >14.5	<20,000 Btu >20,000 Btu
Xcel Energy	Ductless - $300	SEER 16+

Statewide ASHP Collaborative

ASHP Collaborative Vision

*"We strive to make ccASHPs the **first choice for contractors and homeowners** that are replacing electric and delivered-fuel heating systems, or air-conditioners by 2030.*

***Every installed system will be optimized** to provide heating as well as cooling."*

Collaborative Goals

- Maximize energy savings and utility program performance
- Promote technology to consumers
- **Support the trade industry to adopt ccASHPs and integrate into their business models**
- Accelerate a technology that will play a role in decarbonizing Minnesota's economy
- Coordination among MN utilities

ASHP Collaborative Elements

- Technical guidance and installation quality – Contractor Resources
- Installer training and support
- Manufacturer and Distributor engagement
- Utility coordination
- Marketing support

Technical guidance / installation quality

- **Goal:** *Ensure ASHPs are installed properly, resulting in savings, optimal performance, and high customer satisfaction*

Activities:

- Product specification and/or qualified products list
  - Ensure correct equipment is rebated and installed
- Installation best practices guide
  - Contractor resource for proper installation and equipment selection
- Quality control inspections
  - Ensure equipment is installed and setup correctly

Installer training and support

- **Goal:** *Identify and build ASHP product champions and broaden contractor understanding of ASHPs*

Activities:

- Complete 12 ASHP trainings throughout the state
  - Intro to ASHPs
  - ccASHP specifications
  - Installation best practices
  - Customer engagement, benefits, and sales
- Direct to company engagement with 6 contractors
  - Interest in growing ASHP portion of business
  - Hands-on training with company and all staff

Manufacturer and Distributor Engagement

- **Goal:** *Align efforts of ASHP collaborative with manufacturer and distributor efforts and leverage funds.*

Activities:

- Partner with manufactures and distributors to promote and advance the ASHP market
  - Engagement opportunities - contractor training, promotional materials and events, etc.
- Map MN ASHP supply chain
- Influence product development to optimize equipment performance

Utility coordination

- **Goal:** *pool resources, accelerate results and align efforts*

Activities:

- Coordinate utility efforts to accelerate ASHP adoption
  - Disseminate utility program information to contractors, distributors and manufacturers
- Gather utility data to map ASHP market in MN
- Annual state of the ASHP market report

Marketing Support

- **Goal:** *Optimize and streamline messaging to consumers*

Activities:

- Coordinate and leverage utility marketing efforts and resources
- Develop case studies and customer testimonials
- Aggregate and provide successful marketing materials from around the country and region

How to get ready for ccASHP technology

1. Think about ideal customer applications and benefits in your service area
2. Attend manufacturer training
3. Connect with your local utility to learn rebate details and get on qualified installer lists
4. Stay tuned for more resources from the statewide collaborative (training, guides, etc.)

Ideal applications

- Existing electrically heated homes (baseboard EFAF)
  - Customers save 55%
- Delivered fuels customers (propane, wood, oil)
  - 30% cost savings
  - Reduce propane consumption by 60%
- Homeowners looking for cooling
  - No ductwork
  - Replacing current air-condition
- Where electricity is inexpensive (fuel switching from gas to electric)
  - Utility with electric heating rates and/or DR programs

Product Options

Ducted dual fuel

Ducted electric

Ductless

Product Selection

Existing Heating System	ASHP Options	Considerations
Electric Baseboard	Ductless ccHP	Sizing, home configuration, number of heads
Ducted electric furnace	Ducted ccASHP	Sizing and electric plenum backup
Propane furnace	Ducted dual-fuel ccASHP	Sizing and change over temperature
AC Replacement – home without ductwork	Ductless ccHP	Sizing, comfort needs, product cost
AC Replacement – home with ductwork	Ducted ccASHP	Sizing, energy costs, product cost, change over temperature

Customer Savings and Satisfaction

- Sizing:
  - Properly sized to meet designed portion of the heating load
- Switchover set point:
  - Ducted Systems: 10 degrees F
  - Ductless Systems: -13 degrees F
- Controls:
  - Ducted Systems: automated controls to bring up backup
  - Ductless Systems: manual action by homeowner
- Interaction with back-up systems
  - Ducted Systems: Integrated installs with shared controls
  - Ductless Systems: Separate systems

Interested in learning more?

Join the collaborative!

- Looking for contractors, distributors and manufacturers to participate

- Sign up today – leave business card or fill out sign up sheet

Stay tuned for info on upcoming training and ASHP events!

- http://mncee.org/heat_pumps

THANK you!

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