

nr	Funding priority	potential impact on decarb speed	Strategic importance decarb	New opportunities for accelerating decarbonization heating	TC links	Type of action	AHRI input?
8	3	H	1	Identify solutions for technician shortages. Including working through utility partnerships that focus on cost effective solutions for rebates.	Mass Save? Utilities MTG	Regulated utilities can't provide services that require permits/behind the meter. Can provide incentives. Identify other methods to reduce shortages/reduce requirements. E.g. rebate conditions, lower cost upgrade packages?	No
3	2	H	2	Require adjustable compressor to reduce defrost cycling	TC 8.10 8.11 205? MTG	Work define the impact of defrost cycling by climate and application Start with nyserda Lit review Additional work by local utilities publish AMRE by doas mand vrf based on Modelling	yes
5	6	H	3	Cover building requirements with off the shelf cost effective plug and play solutions Esp low temp Hydronics, high capacity heatpump ventilation with erv with fan controllers	AHRI?	80% solution analysis - NEEP neea etc. to define low expertise products suitable for utility introduction define tests, define applications Market research about availability in 2 years if encouraged Indoor heatpumps for attic or workroom installation with outside air ducting and /or remote ventilator	yes
11	4	H	4	Industry regulators support studies on heath benefits of ventilation and full humidity control. See recent studies	TC 1.12, TG 2.1 AQMD, TC 8.10	recent studies, in particular Harvard etc.	No
	5	h	5	silent outside units to reduce communal resistance to noisy heatpumps	TC 2.6 with support from 8.10, 8.11,	Evaluate european sound requirements for HVAC units, best in class solution in the US. Regulator to push in quick decarb states to stop resistance of non adopters.	YES
	3	H	5	define solutions for standard HP use on hydronic system and or integrated AHUs with gas and cooling: lowering hot water temps. Including separate sensible heating/cooling from ventilation.	TC 6.1 with support from 1.4, 8.10, 8.11	Define the impact of HP lower temp on redesign. Identify solutions for short fall incl. local VRF, envelop improvements, hybrid systems	yes
10	1	H	5	Allow for new cooling to encourage heatpump use in colder climate zones Offer PV to reduce summer impact on network noise rediction	Decarb task force , TC 2.8	Evaluate whether benefits of faster adoption offset extra power for cooling	No
12	5	vh	6	Smarter controls network including identification of novel solutions Like colocation water heatpump with dryer and cooling equipment	TC 1.4	Identify barriers, set up monitoring structure based on low cost interfaces	No
2	12	L	7	Sizing ventilation for actual and equivalent fresh air requirements	TC 8.10, 8.11	Define additional costs of extra ventilation with DCV/ERV optimization. Trade off healthy live years versus additional costs.	??
1	7	M	8	Doas full dehumidification reduces energy use With recirc air at unit for use during unoccupied	TC 8.10, 8.11	Identify exceptions starting with the most likely ones le dry doas but also high internal loads from plants etc Create a table for all zones of capacity implications for standard schools and offices For inclusion in the next net zero design guide	No
9	9	M	9	Require ventilation to pressurize building in order to minimize air infiltration and heating costs Requirements: define a test. Set a rule of thumb for designers, e.g. 10% higher oa cfm? Preferably without pressure sensors.	TC 4.3 with 8.10, 7.6 7.7, 7.9 1.12,	provide simple solution that on average has better results then current practice vs just increasing complexity.	yes
6	8	M	10	Performance based erv requirements for heatpumps allowing non erv demand control solutions if they meet the standards efficiency requirements Including condenser using return air Overcoming maintenance reliability issues relating to ERV wheels.	8.10, 1.4 , 7.6	Compare cost effectiveness of ERV versus DOAS demand control without building management system	yes
7	11	L	11	Define safe humidification for ld heatpumps by oa condition ensure sufficient regulation and natural constraint to prevent building damage	TC 1.12	existing RTAR	yes
4	10	M	12	Accelerate introduction of natural gwp refrigerants now used in europe esp 290 in air to water applications with rooftop or other outside compressor units. on and define aangaat tracking for and define roll our by utilities	TC 3.2	Invite eu deregulation consultancy (Tno?) to do a review of us introducti	yes

utility input	funding	Type of action
NO only behind the meter	CEC??ashrae?	Only via rebate conditions, e.g. funding of 80% solutions
Very high	Utilities, involve 90.1	RTAR
linked to rebate requirements	Utilities by region defining rebate requirements	RTAR
NOT	ashrae doe health	RTAR
No - regulator issue	ashrae doe health	RTAR
Yes	ashrae	RTAR
not an issue in MA. Should be allowed	ashrae	RTAR
link to rebate requirements	Regulators, rebators	?
Longer term	doe	RTAR
Detail	ashrae	RTAR
define workable solution	ashrae utilities	RTAR
yes Wheel maintenance is a problem	Utilities , REGULATORS	198/920
No	Ashrae	RTAR 112
yes 6 month study	Ashrae regulators	RTAR