

Goal: date on Franklin's work so far

Agenda

- Quick review of TRM project
- Peak Demand/Load Profile Interviews
- Existing Measure Update
- New Measure Update
- Next Steps

Review of TRMAC Teams

Franklin Team

- Sr. Program Manager: Dean Laube – at meeting
- Technical Manager: George Roemer – on line
- Sr. Engineer: Rick Berry
- Engineering Mgr: Jim Stebnicki
- Principal Engineer: Leo Schaub
- Sr. Research Analyst: Tom Syring

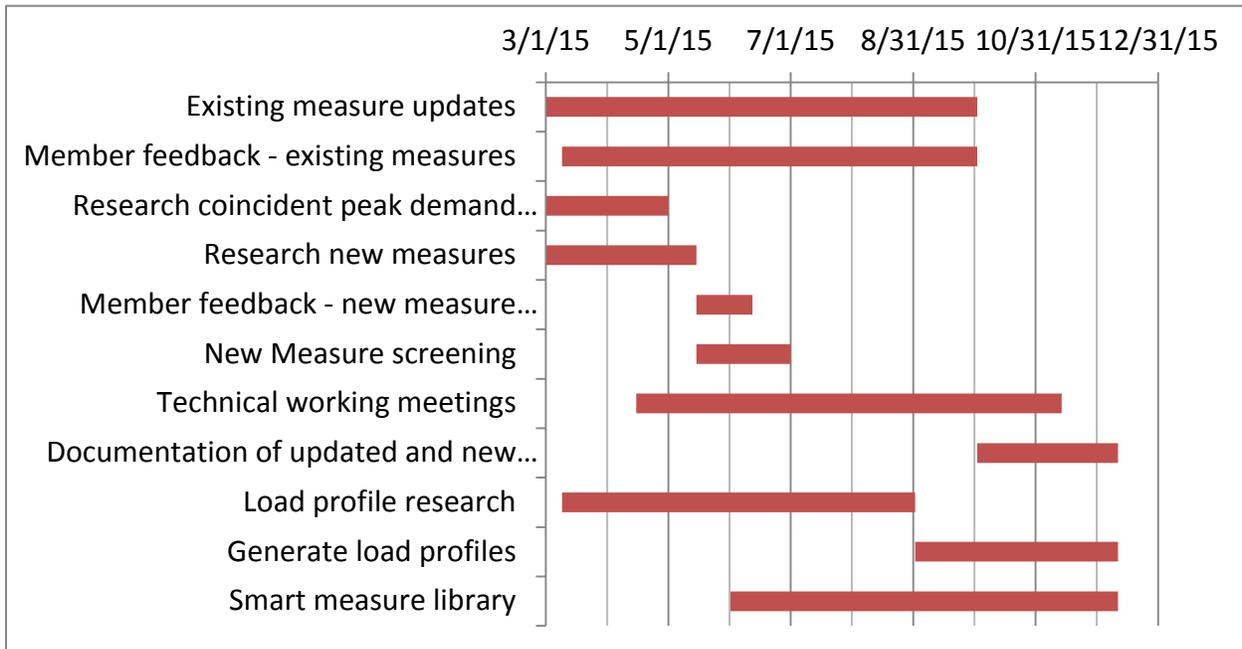
Itron Team

- Principal Engineer: Bob Ramierez
- Sr. Principal Energy Consultant: Marc Collins
- Sr. Principal Energy Consultant: Jennifer Fagan

Deadlines for Major Deliverables

Date	Deliverable
January 30, 2015	Kick-off meeting with the Department and TRMAC
June 1, 2015	List of codes and standards changes
November 13, 2015	Draft TRM delivered
December 11, 2015	Final TRM delivered
December 11, 2015	Smart Measure library complete
December 11, 2015	Electric and gas load profiles delivered

TRMAC Task Timeline



Peak Demand and Load Profiles - Dean

- Utility interviews conducted (8)
- Information summarized based on responses from participants
- No surprises
 - Peak demand hits in the afternoon and resembles MISO definition
 - Load profiles are used for planning, forecasting, and program design

Thanks people for interviews – all complete and notes summarized and sent to Commerce yesterday; overall peak falls at 5 to 7 versus 4 – 6 for rural versus urban

Existing Measure Review – Globally - George

- Mainly based on working group input – 4 to 5 groups
- All Measures
 - Codes and standards updates, notes on 2017-2019
 - Review of costs
 - Simplify inputs – reviewing sources to see how others do it
 - Review of sources, original sources vs secondary

Existing Measure Review - Lighting

- Cost review, especially LEDs - looking more closely at lighting where changes happening rapidly; e.g. standard changes for T8 lighting costs. There is not really good input for cost sources – mostly looking at internet.
- Research adding In-Service Rates (ISRs) – came up as topic in working group

- Research standardizing inputs, adding options for added delivery models (DI, upstream, etc.) -
- More research on Coincidence Factors (CFs)

Existing Measure Review – HVAC (Cooling and Heat Pumps)

- Research Heating hours vs HDD equation – their approach is to do modeling and comparing to current approach
- Shorten measure life for early replacement measures, ECM retrofits
- Research QI measure life
- Research adding ECM retrofit option – good research on ECM as retrofit in NE they will review and try to incorporate;
- Research heat pump hours of operation – what hours, what efficiencies, peak load impacts
- Contractor requirements for tune-ups – documenting procedures

Jeff H – could Franklin share links to research on, for example, ECM retrofit reports. It would be really useful to be able to review these ourselves.

George – says yes, they can put something together on this and get it sent out

Existing Measure Review – Heating (gas-fired)

- Research Heating hours vs HDD equation – have looked at in other locations; more similar by building types than cooling; are doing modeling on this to compare
- Research HDD65 and CF vs HDD55 – for some measures HDD55 might be more appropriate and remove correction factor (assuming stick with HDD)
- Research correct hours and default size for steam traps – overall hours versus full load hours
- Review commercial boiler sizing – equation for savings for boilers – some discussion if should use existing or new efficiency when calculate savings and what building load should be assumed
- ERV options – cooling savings, deemed hours – kWh and KW savings and also a way to simplify calculation
- Maintenance procedures for commercial forced air maintenance – documenting procedures – same issues as on tune-ups

Existing Measure Review – DHW

- Review temperatures inputs used for each measure – what are best values for each territory?
- Simplify inputs – standardization
- Review Pre Rinse Spray valve temperature – is hot water temperature assumed correct or does it need to be updated?

Summary: They have updates to most measures – mostly simplifying and making them easier to use.

New Measures - Sources

- New measures requested by TRMAC and DER
- Franklin added five more
- Priority based on: impact, data available, designed in other TRMs
- Priorities (High, Med, Low)

New Measures

- High – plan to add – enough information to proceed
- Med – most likely add, but reviewing further – some still ironing out how to approach
- Low – not planning to add – some of the discussion may be on these – if these are prioritized higher by you
- High Priority - 13
- Medium Priority - 21

New Measure List (from spreadsheet) and Discussion

High (those in italics are ones Franklin is proposing base on what they found in other TRMs)

Residential Smart Thermostat – Residential (Commercial is below) – not currently in any TRMs but a number of pilots under way; each pilot is quite different so challenge will be how to compare; a lot are going with tiered system – Tier 1 – standard; T2 – remote connection; T3 – connected with learning algorithms;

Jeff H – asked about utility controlled t-stats – direct interface may not be fully captured in T3; demand control but also other things; could be t2 and a different algorithms.

George – we are limited in what the studies give us but we'll keep that in mind; valid research is probably at least 18 months ahead so may not have much by end of December; Nest has been doing it for a while so they may have the most and may have to update it at a later point

Jessica – it might be useful to track on a separate list things that we think are down-the-road or future updates; useful to document

Jeff B. – have you come up with categories in that third tier; we have not but they have been roughly defined elsewhere; we are setting on universal definitions which we will include in TRM – this might be a good potential measure for MN pilots under CARD

Heat pump water heaters - request to look at these closer in terms of the heating/cooling interactions – will look at in more detail

Commercial ECMs – a few coming on board in TRMs right now; heating and cooling and DHW pumps; expect to have a number of fan and pump measures

Duct sealing w/ Aroseal – some issues elsewhere with where they are located (conditioned versus unconditioned space);

Fresh energy person pointed out that new code requires ducts be in conditioned spaces only

George: may need to make a distinction for new construction versus retrofit.

Mini split ductless (single and multiple head) – accommodating back up equipment; baseline information

LED Troffers – looking at for costs; it will be more of an update

Advanced Power Strips – gone to two tiers; smart strips now T1; T2 product also senses occupancy from motion or infrared signal; T1 covered in a lot of TRMs but T2 have not; savings for T1 savings going down (100 to 50 kWh) and T2 coming in at 200 kWh.

Guest Room Energy Management Controls – covered a couple of ways in other TRM; what type of HVAC should be accommodated (PTAC or older central systems). Other TRMS have quite a range – good savings and cost-effectiveness especially for electric units.

Agricultural measures (list separately) – this is an entire category – about 5 measures looking at – mainly looked at other TRMs and a good number covered, approaches make sense

AG - Efficient High Speed Fans (exhaust, circulation) – same as above

Building Operator Certification – generally not covered. In Michigan savings are based on studies; not a prescriptive measure but could be used for planning. Michigan does run it as prescriptive

Commercial ENERGY STAR Dishwasher – recommended by Franklin based on TRM review; to complete ENERGYSTAR offering

Compressed Air System Leak Survey and Repair – recommended by Franklin based on TRM review; may vary by compressor type or control type; collect savings from vendor studies and report back

Medium (those in italics are ones Franklin is proposing base on what they found in other TRMs)

Commercial AC cycling – not covered in other TRMs but will look closer at residential AC equipment and smaller sized commercial to see if it makes sense to extrapolate from what is available

Commercial programmable thermostats – likely limit to small commercial – rooftop units; few programs offer; a couple of studies but proprietary so may not be able to share; similar to residential

Energy Recovery Ventilators (ERVs) (Residential) – do have in TRM for commercial and this would be to add for residential; some code issues to iron out, or air sealing that might be required to be done and they will include that information

Residential ECM motors – similar to commercial measure they will investigate what is available; best items are pumping applications; a few fan measures; e.g. DHW pumping (Multifamily).

RTU controls – stayed away from outside vendor studies; a few studies in CA looking at variety of manufacturers; they are getting decent savings; a lot of work will be defining what types of systems and what are they controlling.

Mark G – is this geared toward smaller units

George – yes, simpler systems

Outdoor lighting (res) – not much for good information or studies – current control, number of hours; it is covered in a few TRMS so could come up with something and then revise later as more information available

Fast Acting Doors – in a few TRMs; not much available for studies but can take a general approach;

Door/Pit Seals - in a few TRMs; not much available for studies but can take a general approach;

Hot water system control – new pump equipment with a a variety of control features built-in – variable flow, sensing; that is being added to a number of programs this year

Thermostatic shut-off valve for showers – looked at for a number of programs as a direct install; a little pricy for savings; analyzed savings can be reported on and costs; some issues with performance that were hopefully resolved.

Res variable speed pool pumps – addressing a number of programs – in south and California so they are hoping to be able to extrapolate from those results for MN.

Audrey – didn't we have a statute that didn't allow us to use pool heaters – is that still in effect?

Jessica – she will look into this; our student worker could look into this

Dean – could student worker also look into minimum flow requirements

Laura – CEE Boston has a pool pump project which might be a good resource.

QI/QM for furnaces and boilers – no studies so far;

GSHP (res) – look at adding it to residential section;

Solar PV and thermal – addressed in a few TRM but general not (concentrate on EE); most refer back to same standardized savings calculations

Jessica – we've discussed use of PV watts and are leaning toward use of that tool instead of coming up with an alternative method. I would not prioritize this but some light evaluation of PV watt and what it does and the variables it addresses in it's calculation

AG – Lighting – these covered in Midwest; where do we add it – as lighting measure or as building sector measure

AG - VSD Milk Pump – also covered in some Midwest TRMs; help for a start-up of our Ag section in MN TRM; will be based on engineering calculations

AG - Engine Block Heater Timer - ditto

AG - Insulated Livestock Waterer - ditto

Parking Garage Ventilation Controls – recommended by Franklin based on TRM review

Condensing Unit Heaters - recommended by Franklin based on TRM review

Chiller Tune-up - recommended by Franklin based on TRM review; some program data and some study information; high impact and low cost in other programs

Audrey P (CPE) - said they are offering some of these measures (dryers, parking garage controls and could send Franklin information on how they are doing it)

Jessica B - we should do a review of the CARD grant portfolio so that people know what is available and coming down the pike; Mark and Jessica will discuss offline

Low

VRF systems - main difficulties is the customized nature of the systems; quite custom in nature; with customized measures take a more conservative approach and may be better handled with a custom rebate; hot topic but tough to make a standardized approach

Lighting Controls Residential - not much for information on how these are applied and what the savings are, hour of use; not much to base savings on

WiFi Thermostats - Commercial (residential is above) - not much for information out there yet and what is there is for varied applications; should be on a future watch list

Grain Drying - nothing as far as EM&V studies; one TRM in Michigan; if it is something that is this customized it is better left to custom rebate; drying time varies

Air cooled chiller fan packs - controls for fans on chillers; one vendor and applied to hot climates; limited by how their control works and that is not public information.

Residential boiler tune-up - this might be categorized wrong; they do have program data; similar savings for commercial boiler tune-ups (around 2%);

C/I lighting task tuning - another ECW that just came out; not sure it lends itself well to prescriptive approach; may learn more when CARD study is available.

Water utility measures - some information; looking more into what are standards measures, like variable speed drives (used often but less savings); the way pumps work, get less savings; a couple of measures that may be good and a couple of waste water measure that may work well as a prescriptive; mostly custom, but as research more they may find some options that could be prescriptive and will keep re-assessing.

George summary: they plan to continue their work on the high and medium measures, and will have updates for us later in the summer

To be Determined

Permanent magnet motors – covered under other applications; don't see a need for a separate measure on this technology.

Next Steps

- Summer TRMAC Meeting
- Late July – Early August
- One Day, Several Sessions
- Break out TBD

Mark – going to try to have meetings on same day so travel is easier

Audrey – will we be seeing draft TRM before the November draft? It would be really good to have more time to review the materials and provide feedback by the deadlines.

Dean – that is a good question and is related to Jeff's question about study references; Mark and DER needs to decide how to have a sharing site for references that we discussed previously

Jessica – when we do have a draft, it's clunky but could we just post it on our website and ask for comments;

Audrey – that would work – even if you have partial drafts, or some measure that we could review up front ahead of time.

Dean – we have some concerns about sharing drafts that are too early – where the draft isn't close to review – feedback would be premature because they haven't looked at or reviewed everything yet

Jessica – we will discuss internally with IT staff and coordinate with Dean about how we can do this. With comments on draft measures would anyone object to comments also being posted?

Audrey – I think that would be helpful; could just agree rather than reiterate.

Jessica – so we will proceed with our clunky process and if anyone has any comments or feedback, let me know sooner rather than later.