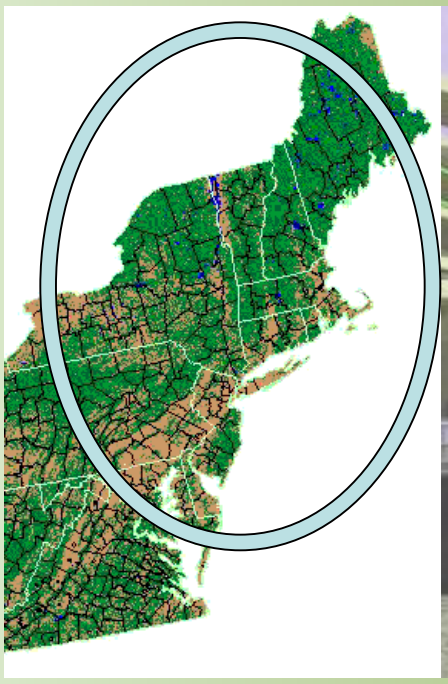
.22 ACH/50

(only at the BBD conference, would that be the "hook".)

Traditional material in modern manufacturing:

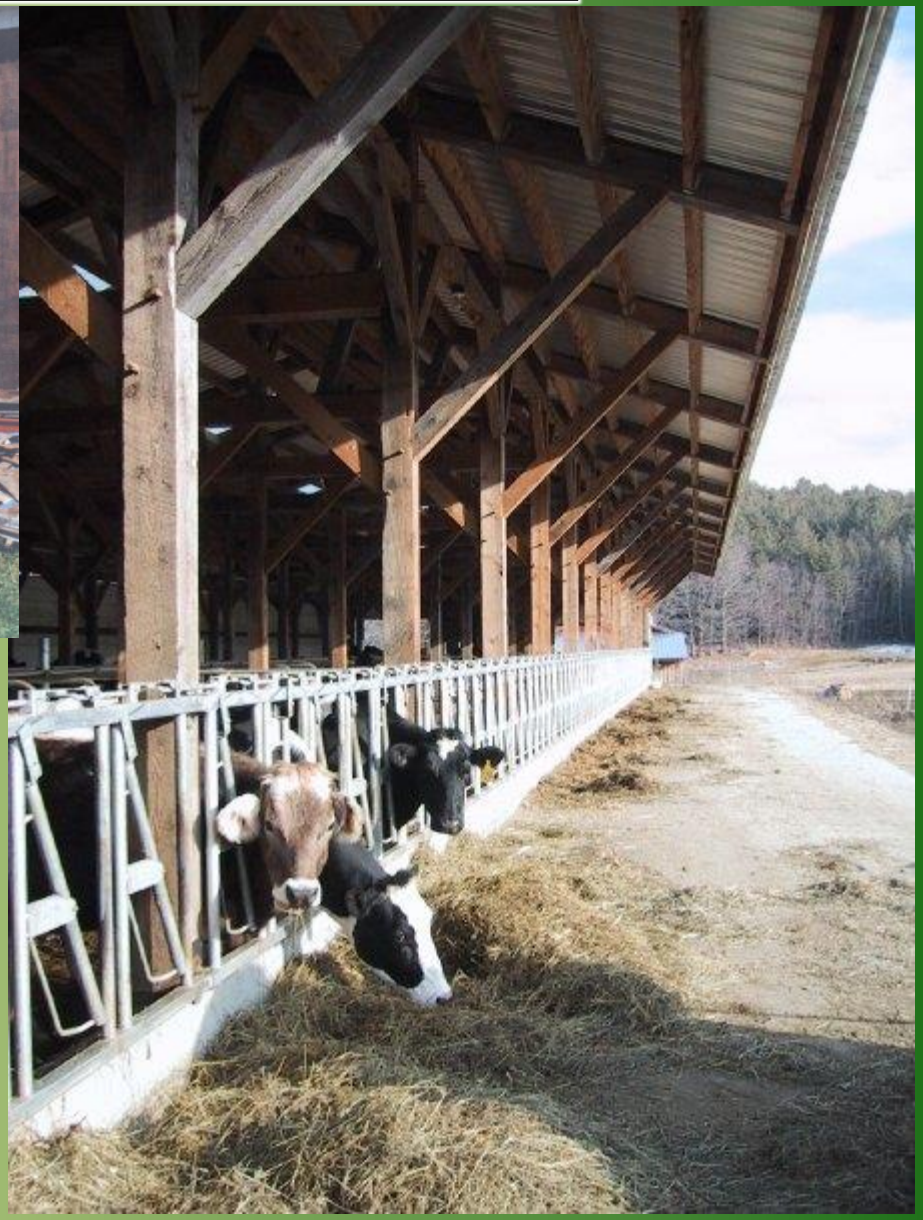


1. High performance custom “PreCraft” and system integrator, with a passion for timber.
2. Interned along Vt’s experience based path to architecture licensure at national TF firms, but settled into practice as a construction manager/constructor (CMC121)
3. Four business activities give us everyday hands on practice in HP homes.
    a. Consult (usually back office subconsult to architects and manufacturers)
    b. Management (design dev’t, cost plan, building shell and HVAC bid process).
    c. Manufacturing (of assemblies: building envelopes, timber frames, stairs, etc)
    d. Turnkey or “GC jobs” (for select and limited southern Vermont clientele.)

Leadership project special case studies:

1. Passivehaus envelope achieving .22 ACH50 with 14” walls combining I joist framing, 4” outboard polyiso, and midwall air barrier. 24” roof insulation with cold roof.
2. Alex Wilson’s nationally publicized and farmhouse “restoration”. 1st time use and system development highlights of 6” cork outboard insulation, Foamglas and Ardex foundation insulation prototype, and open web joist rafters, among others.
3. Net zero, retrofit, and mechanical system developments on a continuum with advances every year in the integration of heat pumps, ventilation, hydronics, etc.
4. Current offerings: a prefab, Passivehaus-capable envelope system with a hybrid timber framework. Retrofit kit and HVAC system development also to be shared.

Early and dirty years in the field were formative and may have qualified us to innovate.

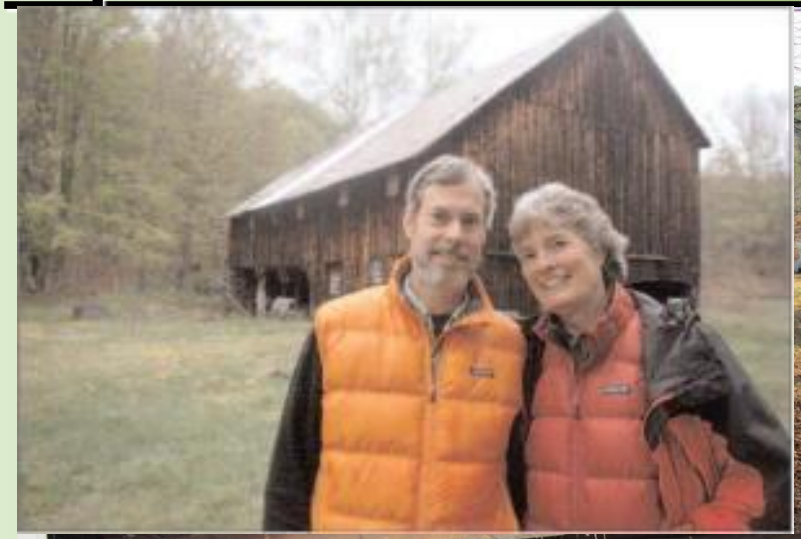


No qualifications besides experience.
Corrections are welcome; these opinions are my own.
Last half of presentation will be interactive so write your questions down.
Still a student of the same themes in Architecture and Environmental Studies as my thesis at Yale: European systems have been evolving here for 350 years.

A corporate proving ground is hard to beat

Maclay, Timberpeg, Bensonwood, Quebec charpentes... It's easier to choose your own path and speed if you've been up to speed with some of the best. Respects and thanks and an encouragement to young people now. We took the automated industry's Swiss 3D CAD/CAM tools and adapted them for our high performance and custom PreCraft. Really useful for energy, cost planning, and complicated assemblies, not just timber.

So fortunate to have the leading practioners' experience and advice, and turn it into "pre-craft"



Low tech barn, high tech IT, flexible tactics.

Are we the only fools in North America building new manufacturing space, and doing it the hard way?

But it does serve our clients well with low overhead and let us build a good team of people instead of a showroom

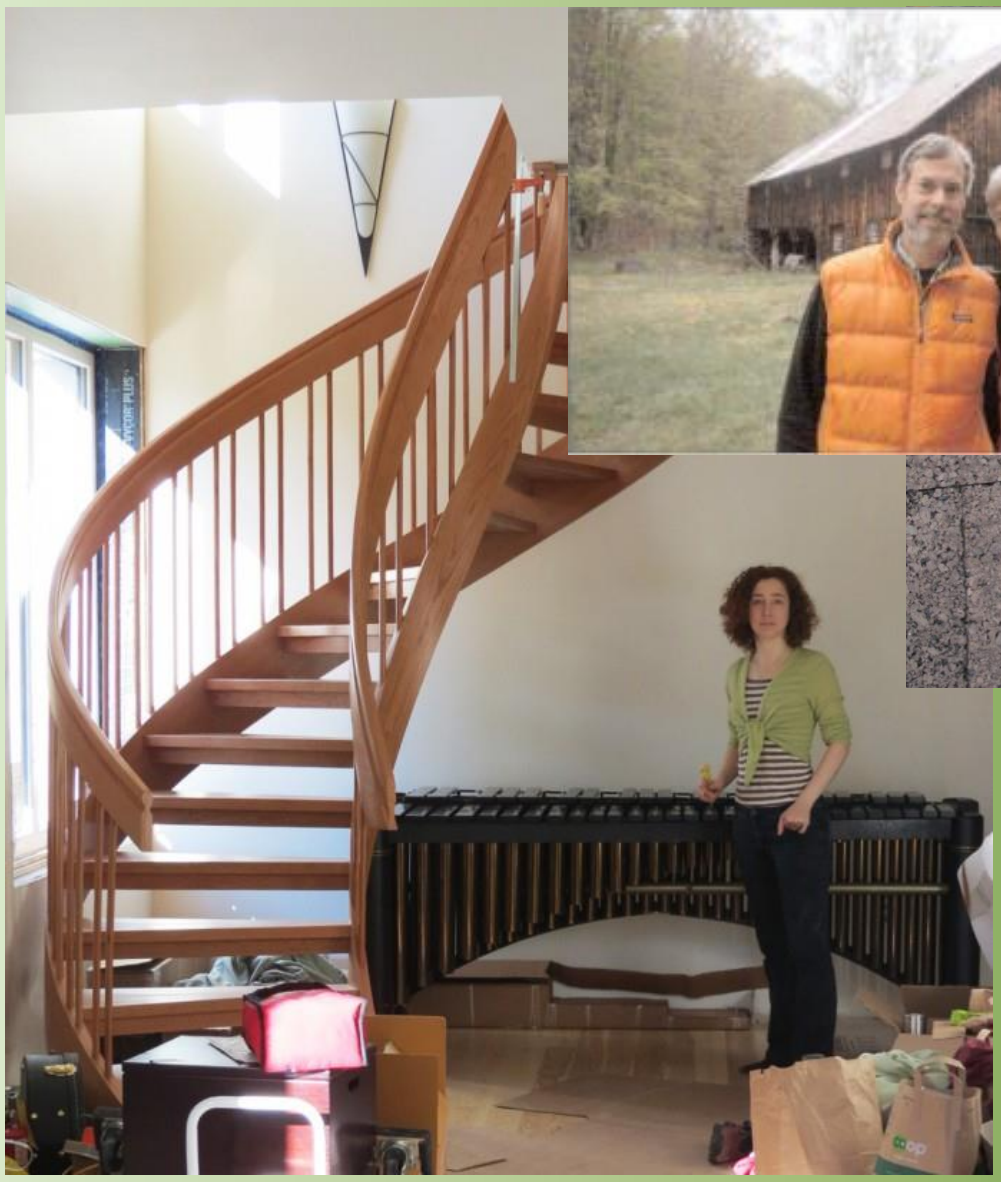
A fine Vermont line between bold and foolish.

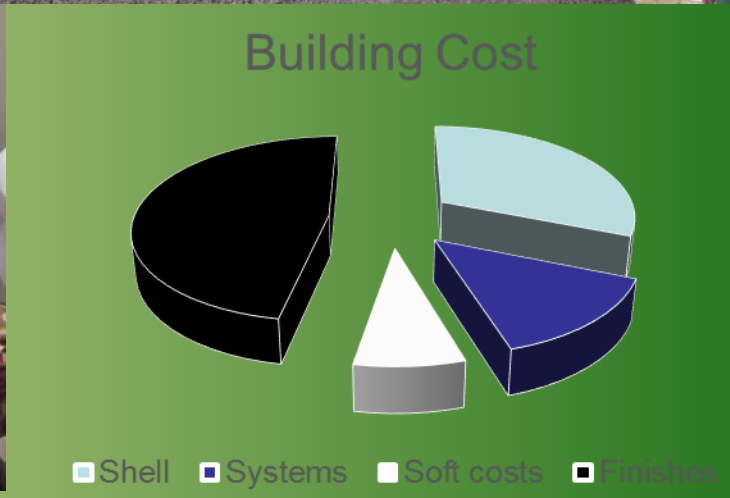
Top Ten Challenge List starts w/ #1:Status Quo

Even the best single building can be negated by poor planning, wasteful processes onsite, and the limits of training and skills in our north American market. Green building and any envelope upgrade will be more affordable as we begin to affect the delivery model itself.

Ready for a curve ball from the right? We are!

CCC# 2: Client Driven R&D vs Cost Planning

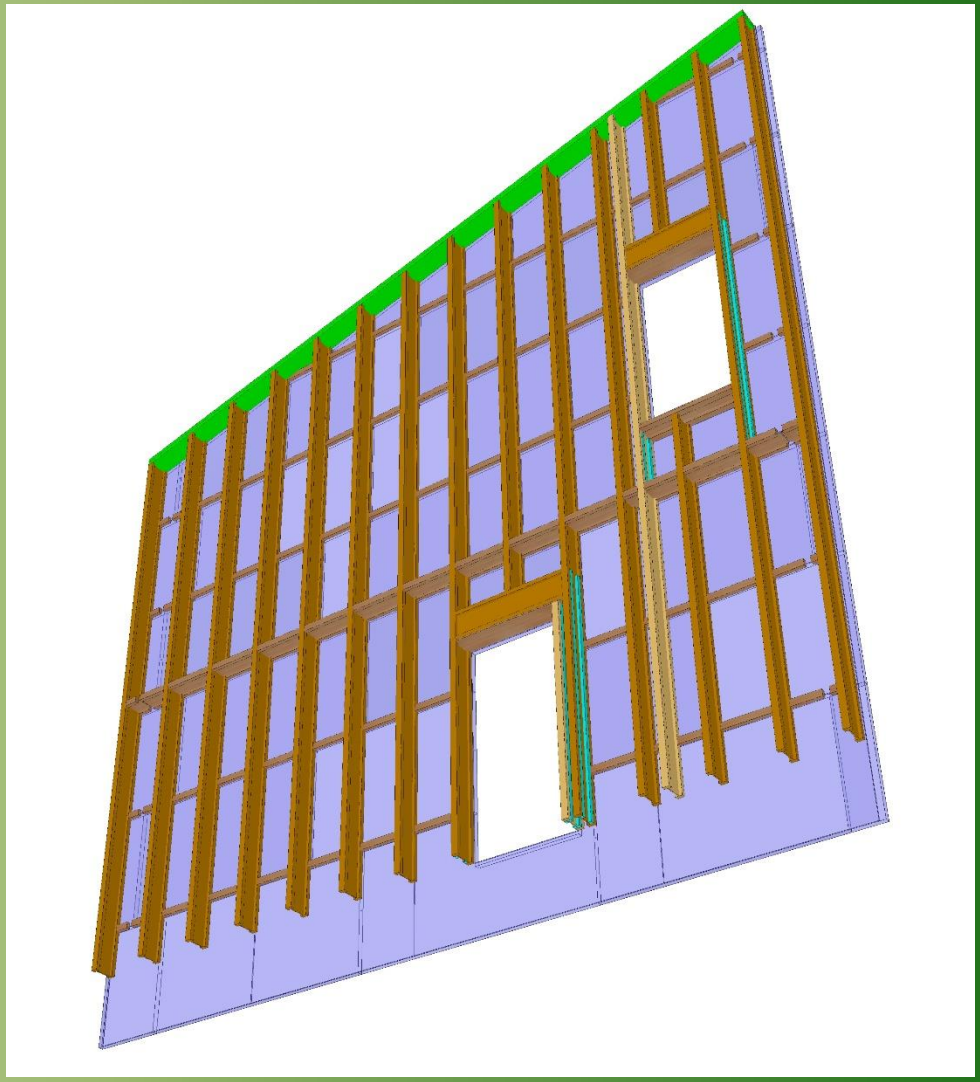




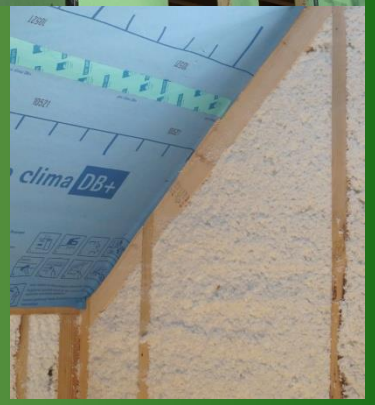
CCC#3: Whole assembly durability in the Vermont extreme conditions of freeze, thaw, & moisture drive

Even the simplest Passivehaus “box”, if it aims for true durability, will include complex layers: In one picture here, outboard insulation, rainscreen siding, exterior extension jambs, overframed cold roof, engineered overhangs…and we still worry!

Challenge #4: Can we lower our framing factor, but keep it real on structure, bridging, & moisture?

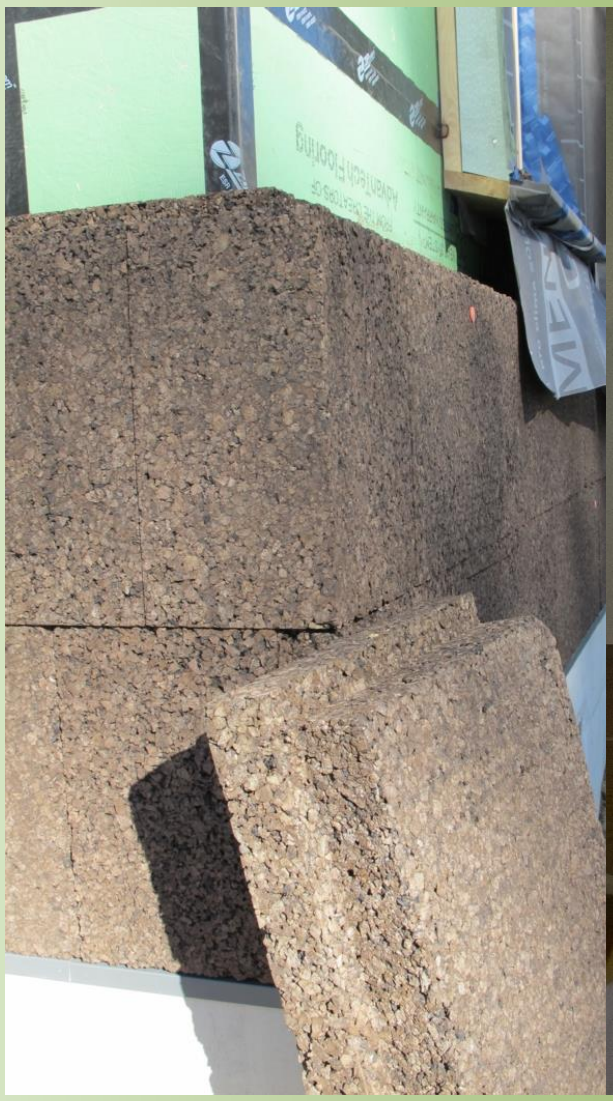


Challenge #4 con't: Lower the roof framing factor, but stay conservative w/ structure & science



CCC #5: Numbers don't describe material durability, health, or the practice of "foam free".

It seems important to have pride in our foam-free assemblies, but not prejudice in our others…



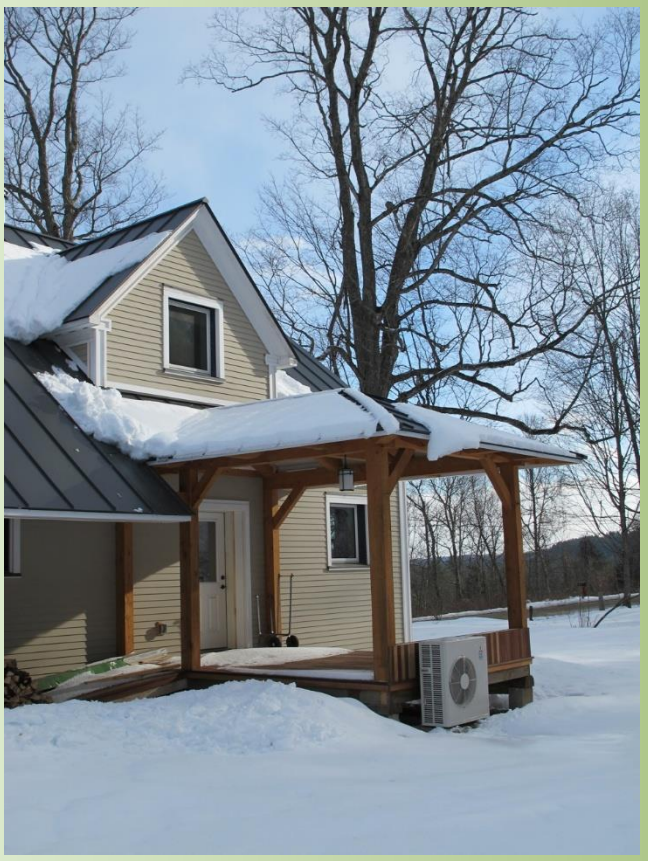
Challenge #6: Outboard insulation is a labor of love. Or it's love/hate, we're still pricing it out….

Outboard insulation challenges, continued: Windows: including our prototype WindowPLUS

Challenge #7: Ground heat transfer doesn't seem to be treated fairly by Phaus proscriptive rules..

Complex realities: our HPH home design embraces ground heat transfer gradients, thermal mass, storage, internal loads, parasites and even wasters…

Challenge #8: The market is crying out for HVAC systems and solutions that install like appliances.



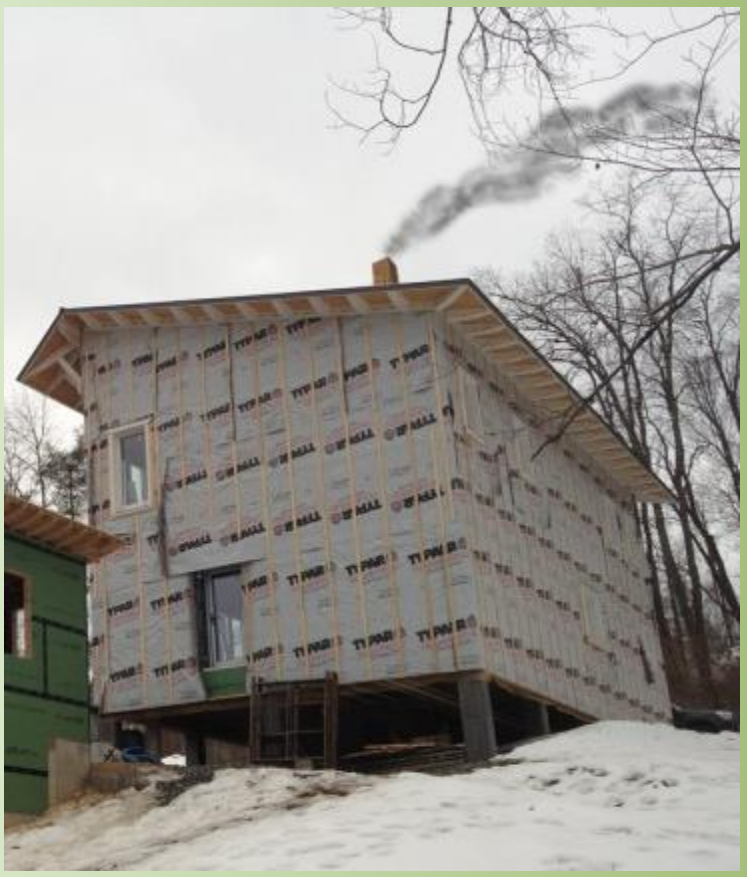
But in many ways it is the systematic nature that drives sales, not the fact that this is a mature market that has the right solution for every situation. We are continuing to push for more options, and continuing to integrate in our development of a line of modular mechanical rooms with CCHPs, HPHWs, ERVs, and resilient function.

Challenge #9 Indoor air quality is why we're really doing this, but even advanced systems are prone to some energy planning shortfalls.

Will continuous ventilation requirements give in to the compelling trend of demand control and setpoint based assessment and regulation of air quality? I do hope so! Also look ahead at the preheat from ground sources, others, even inline heat pumps…

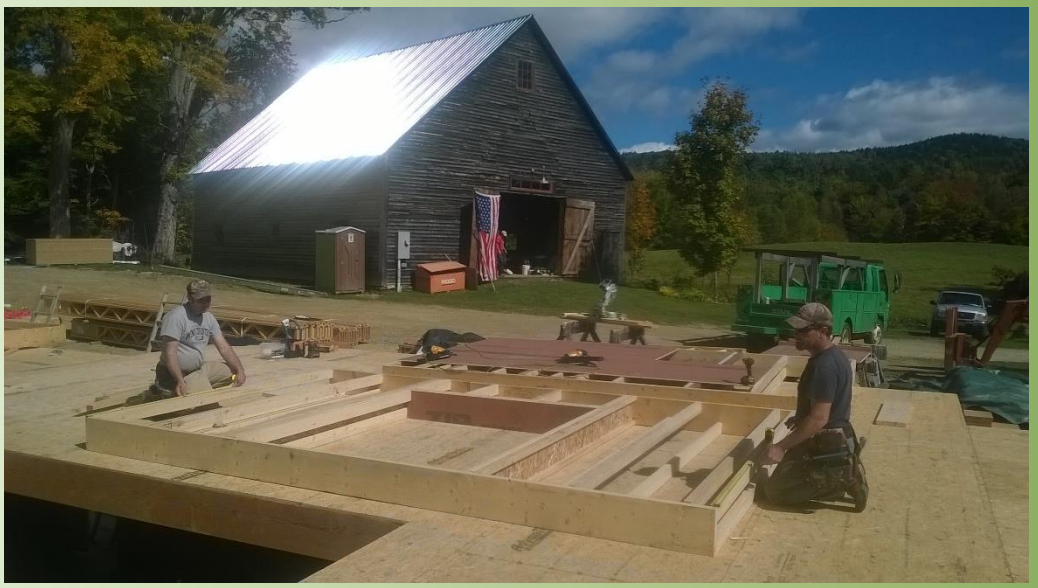
HVAC system integration is still a frontier job done in the field by underqualified pioneers.

Challenge #10: American sized hot water loads and our love of internal combustion.



My client was kidding around with Photoshop….my son Calvin and I aren't.

This top-10 Cold Climate Challenge list goes to 11



Number 11 is our collective challenge to take what the Vermont high performance building community has learned into the mainstream. 2015 is the year to expand into blue collar, business, and even military circles.