Future of Envelopes

(a couple of thoughts)

Leonard Sciarra, AIA, LEED ap+, ASHRAE

Gensler

We used to build light or massive

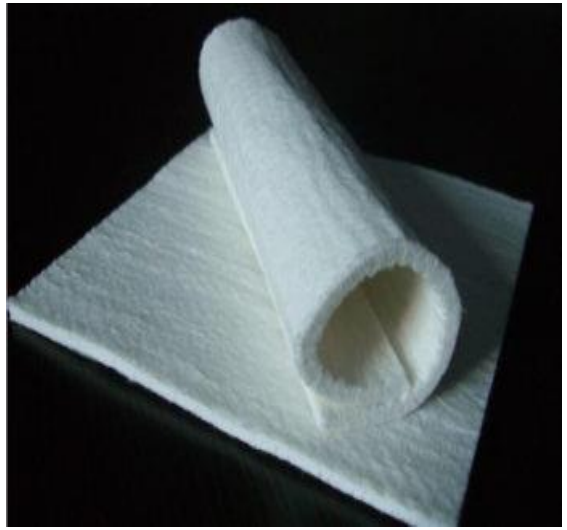

20 years
CENTRIFUGAL
Refrigeration
Carrier

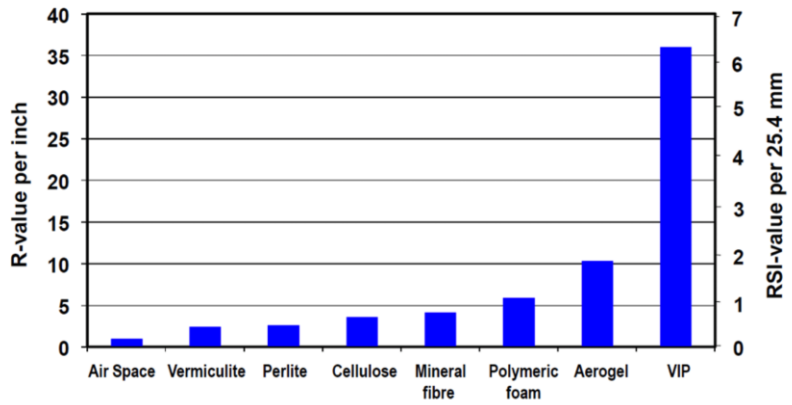

7 10:08

So What is the future…..

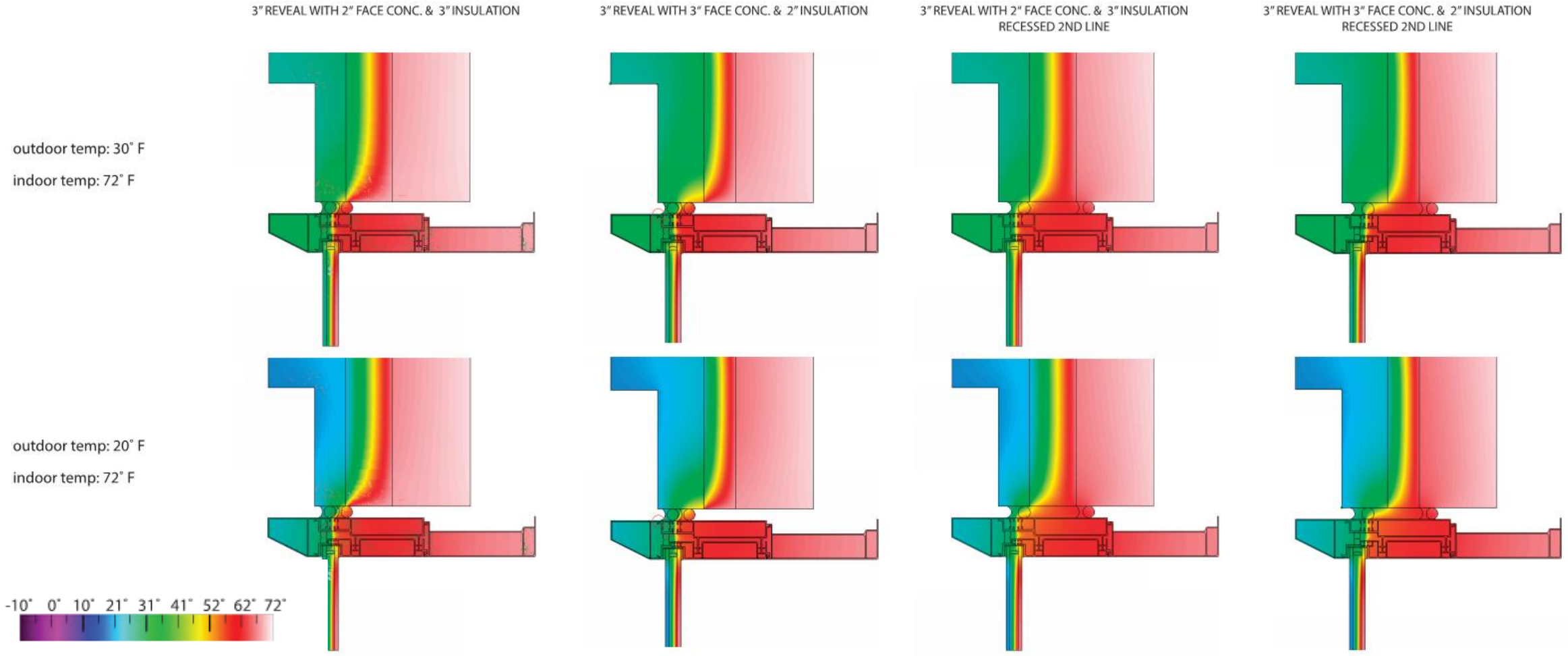
Integrate the benefits of mass and light frame construction

Insulate more with thinner insulation





Better thermally broken curtain wall



Lower SHGC

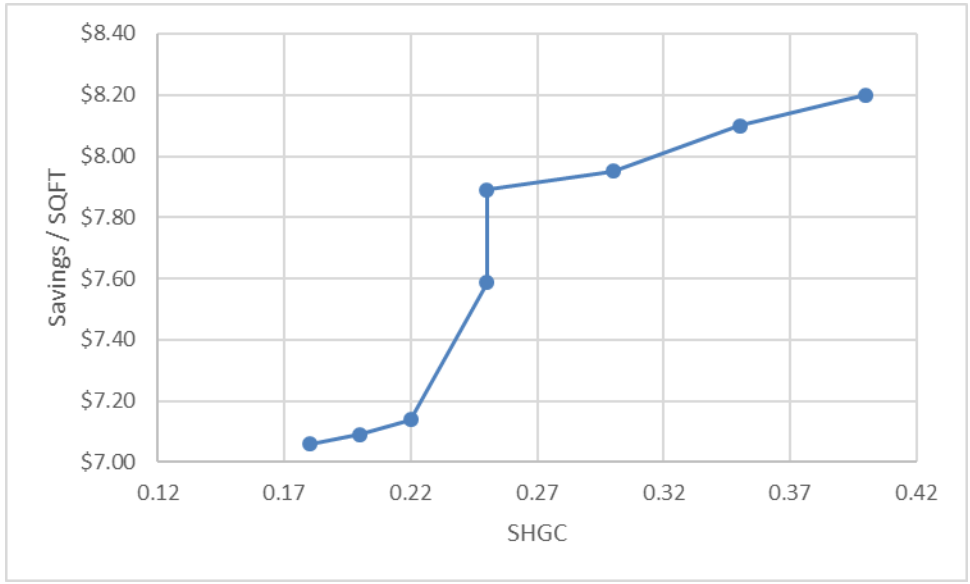
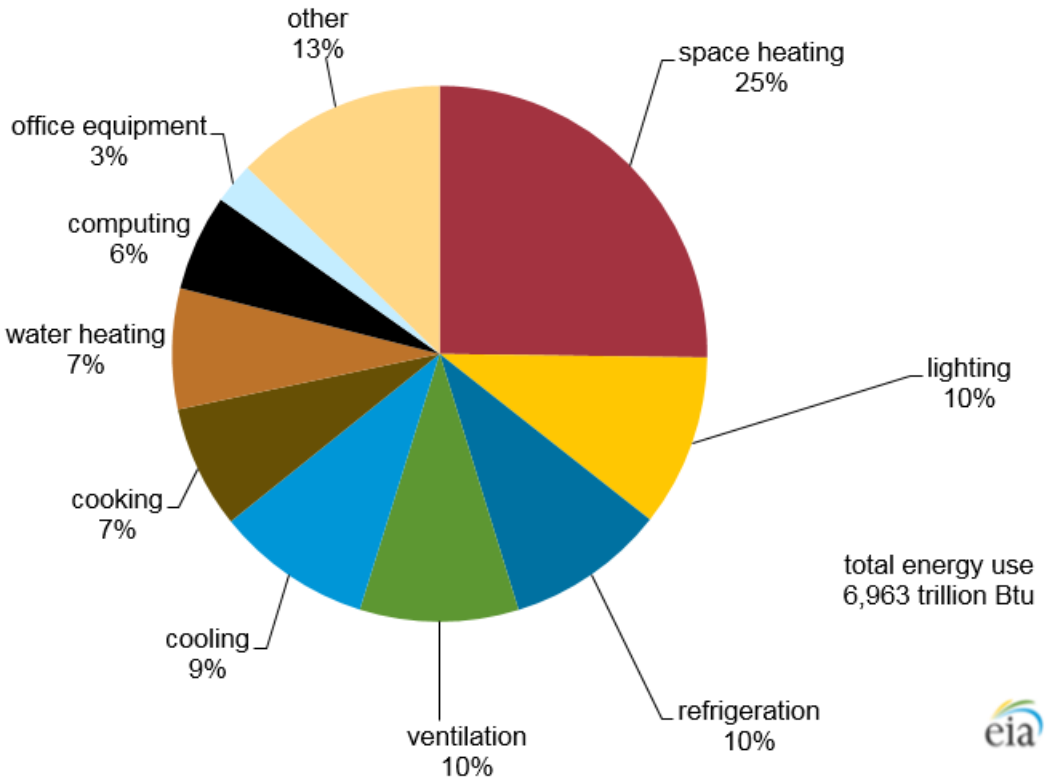
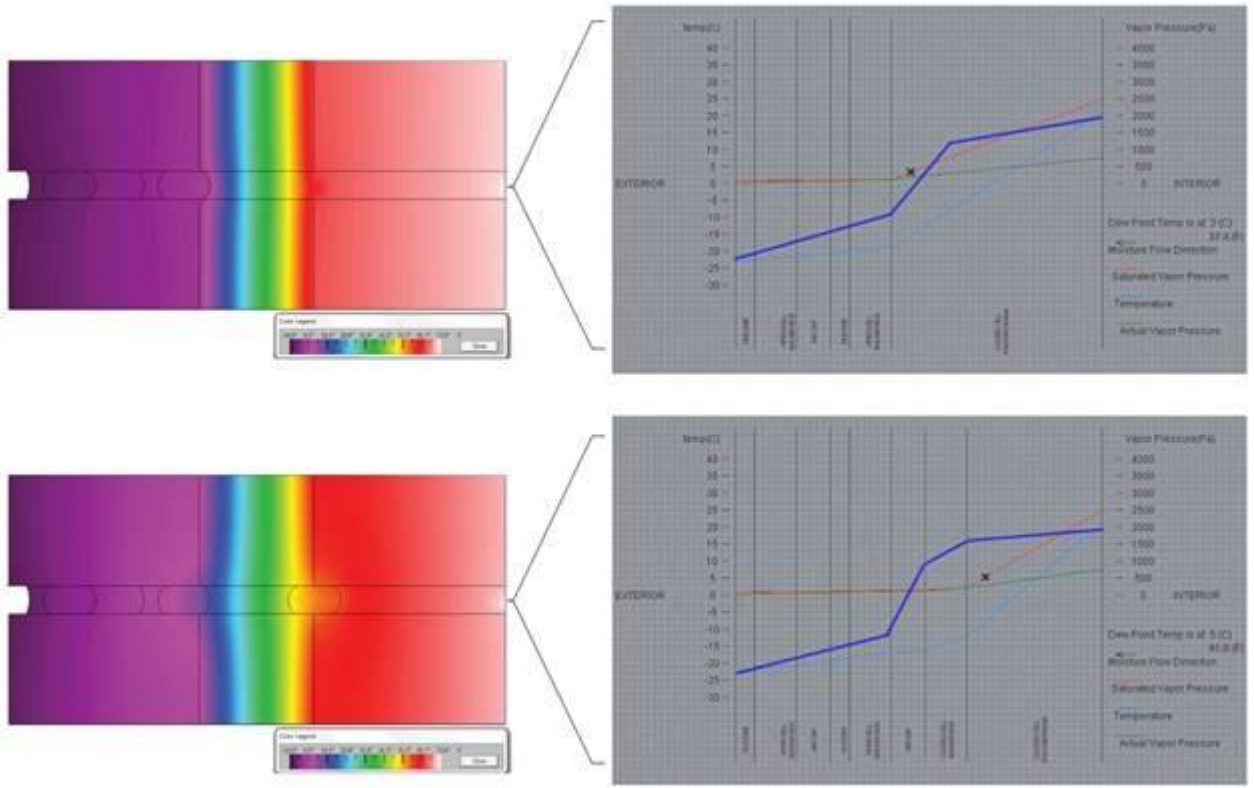


Figure 5. Space heating demanded the most overall energy use in commercial buildings in 2012, followed by other uses



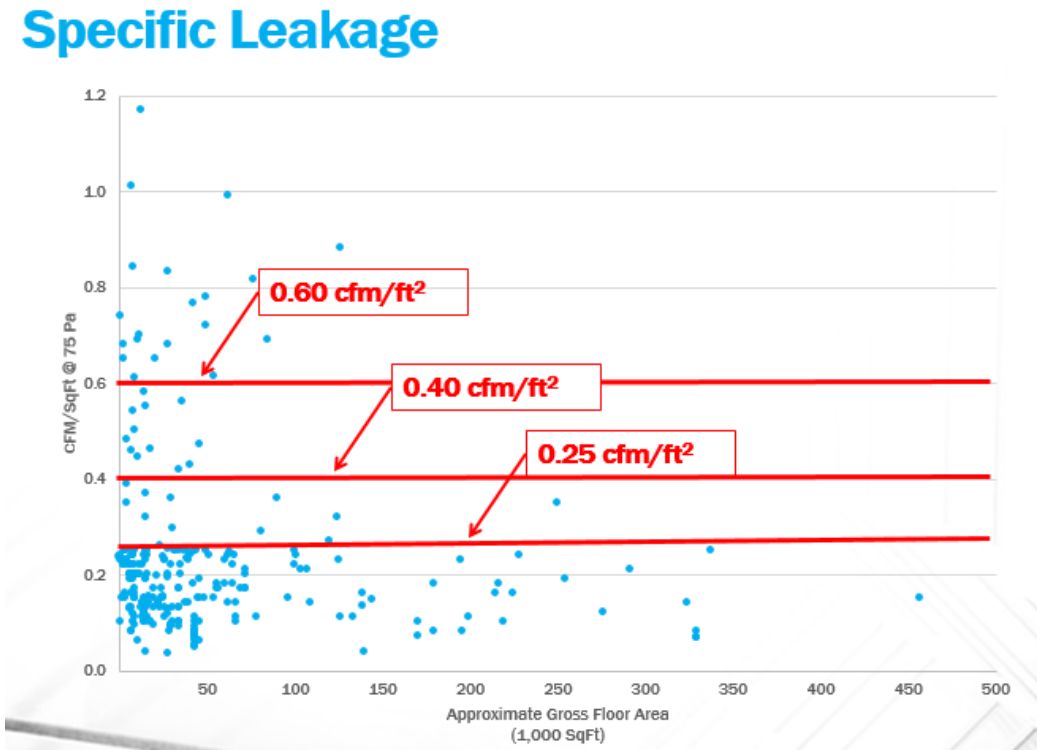
Source: U.S. Energy Information Administration, 2012 Commercial Buildings Energy Consumption Survey.

Redundant water management



Air Leakage

- Addendum l – 90.1-2016



STANDARD

ANSI/ASHRAE/IES Standard 90.1-2016
(Supersedes ANSI/ASHRAE/IES Standard 90.1-2013)
Includes ANSI/ASHRAE/IES addenda listed in Appendix H

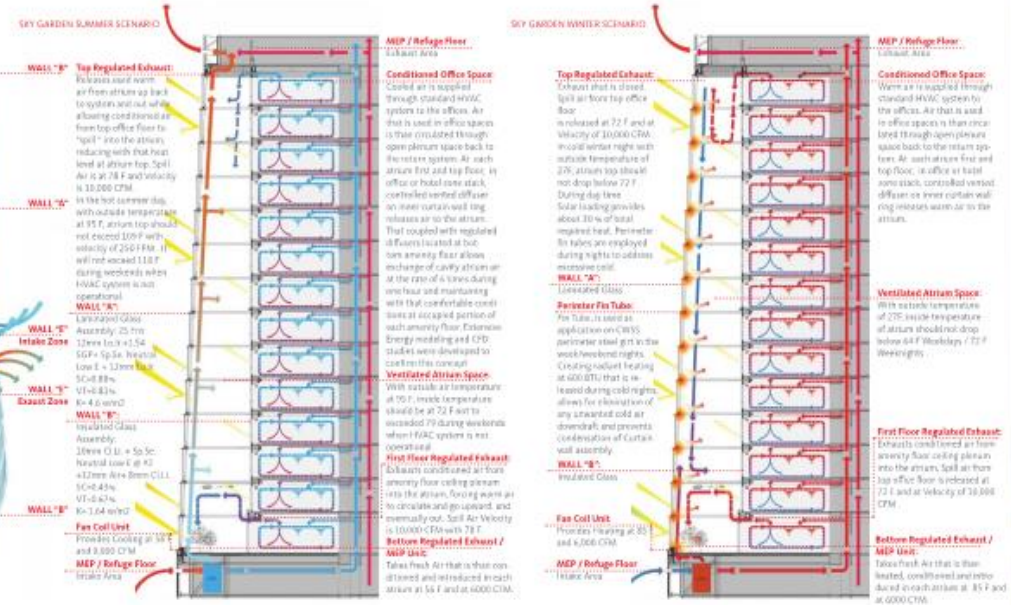
Energy Standard for Buildings Except Low-Rise Residential Buildings

5.4.3.1.3 Testing, Acceptable Materials, and Assemblies

The *building* shall comply with whole-*building* pressurization testing in accordance with Section 5.4.3.1.3(a) or with the *continuous air barrier* requirements in Section 5.4.3.1.3(b) or 5.4.3.1.3(c).

a. Whole-*building* pressurization testing shall be conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air leakage rate of the *building envelope* shall not exceed 0.40 cfm/ft^2 under a pressure differential of 0.3 in. of water, with this air leakage rate normalized by the sum of the above and below-*grade building envelope* areas of the *conditioned* and *semiheated space.*

But Breathable



Thermal Bridging

- Ongong addendum

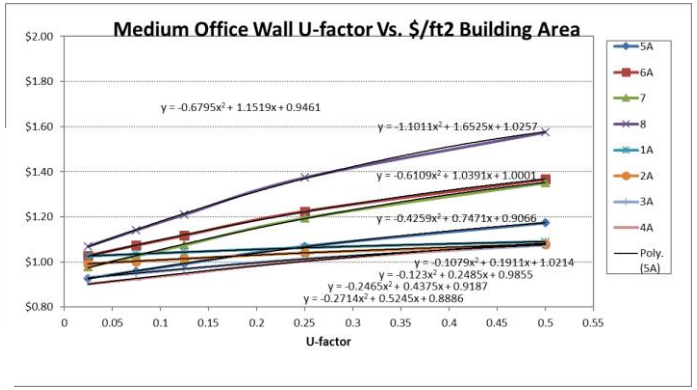
The Implementation of 1365-RP into Standard 90.1

Why Implement 1365-RP into Standard 90.1?

Standard 90.1 provides guidance on determining thermal transmittance through in envelope systems with distributed thermal bridges for a few limited cases. It does not address major thermal bridges such as slab edges, shelf angles, parapets, flashings at window perimeters, etc. In practice, these details are largely overlooked. However, using the information provided by 1365-RP, it is clear that a significant portion of the heat flow through opaque envelope a
that are ign
discrepanc
into wall as
details.

SSPC 901 ENV Thermal Bridge Task Group, Sub-Group Findings

Jonathan Humble
Chair - 901-ENV-TB Task Group
16 October 2014



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Energy Standard for Buildings Except Low-Rise Residential Buildings

5.5.5 Thermal Bridges. Thermal bridges shall comply with Sections 5.5.5.1 through 5.5.5.3.

Exceptions:
1.Buildings located in Climate Zone 1 through 3.
2.Semi-heated buildings located in Climate Zones 1 through 6.
3.Alternative practices shall be permitted where such practices comply with normative Appendix A, Section A10.

Building Integrated Power Generation

The Future is now…..