SMART SYSTEMS 2014 SUMMIT
BUSINESS CONFERENCE DAY 2
2nd October 2014
Institute of Directors, Pall Mall, London

Day 2, Session 1: Smart Homes and Buildings – 10.00 to 11.25
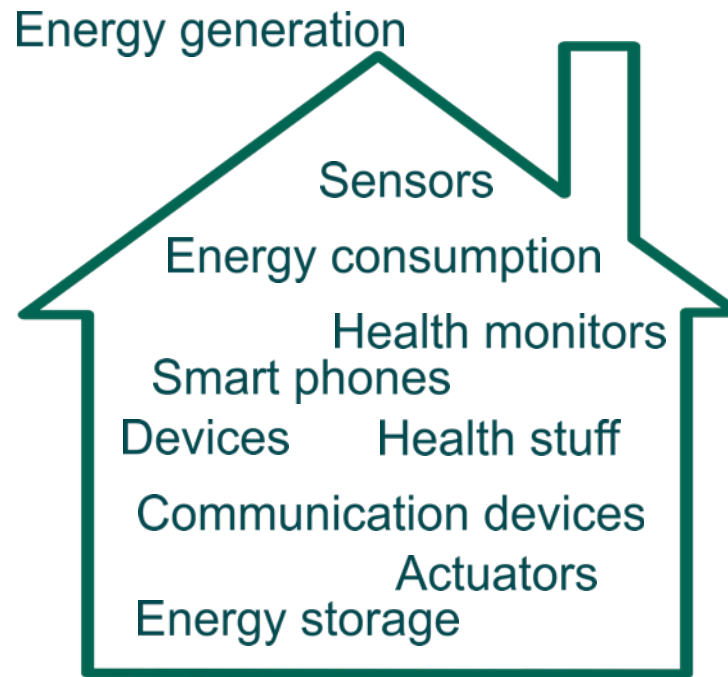
Moderator: Stephen Pattenden – SH&BA

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What makes our Homes and Buildings Smart?

SMART SYSTEMS

Energy

Health

Security

Communication

Consumers   People

Comfort

Economy

What makes our Homes and Buildings Smart?

SMART SYSTEMS
SYSTEM ELEMENTS

Energy generation

Sensors

Energy consumption

Health monitors

Smart phones

Devices   Health stuff

Communication devices

Actuators

Energy storage

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What makes our Homes and Buildings Smart?

SMART SYSTEMS
SYSTEM ELEMENTS
SYSTEM SUPPLIERS

Energy Companies

Communication providers

Health Services

Social Services

Service Providers

Local Authorities

Entertainment

What makes our Homes and Buildings Smart?

SMART SYSTEMS
SYSTEM ELEMENTS
SYSTEM SUPPLIERS
CONSIDERATIONS

Protocol diversity

Interoperability
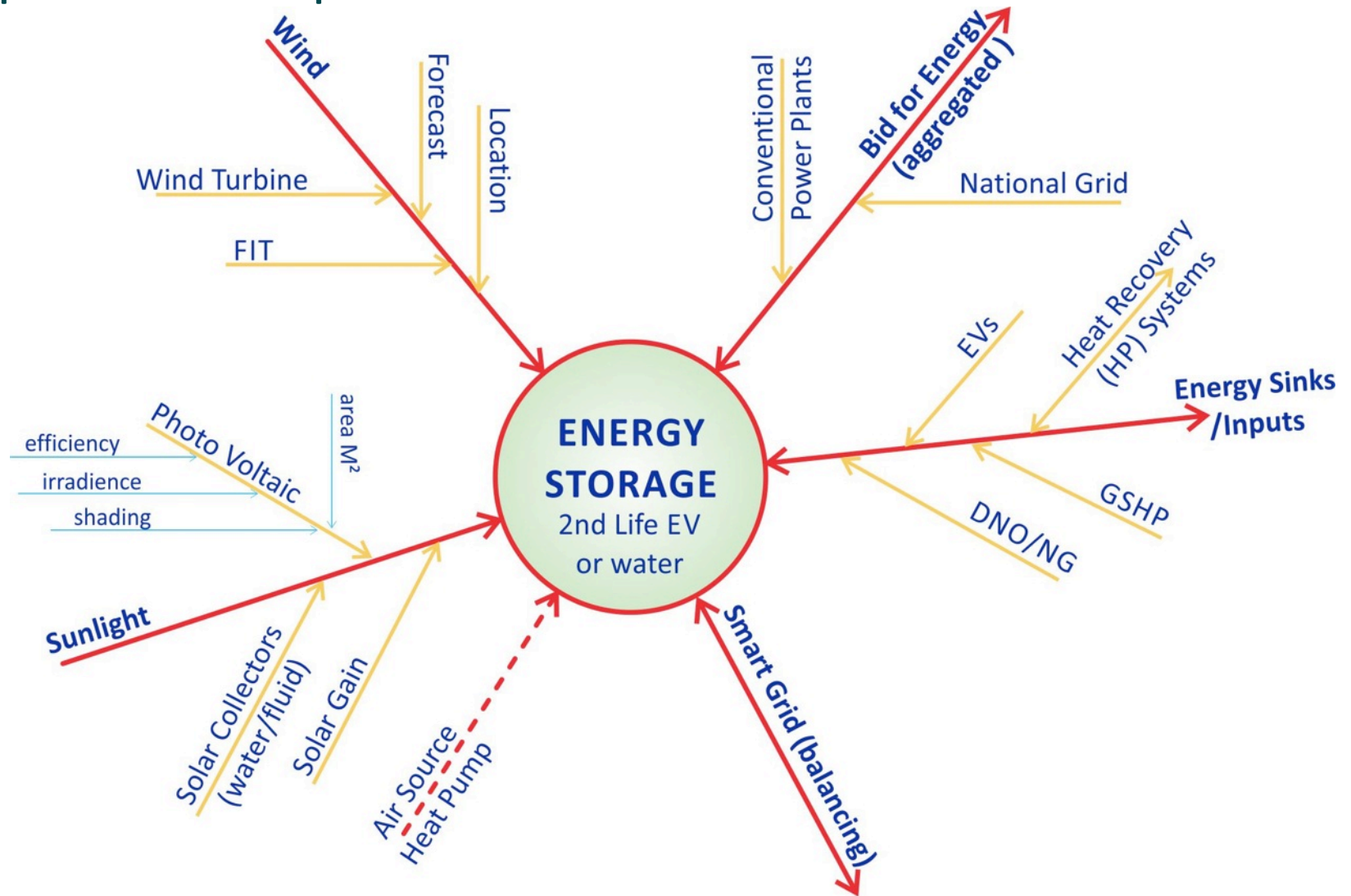
Standards

Big Data   M2M

IoT   Hypercat
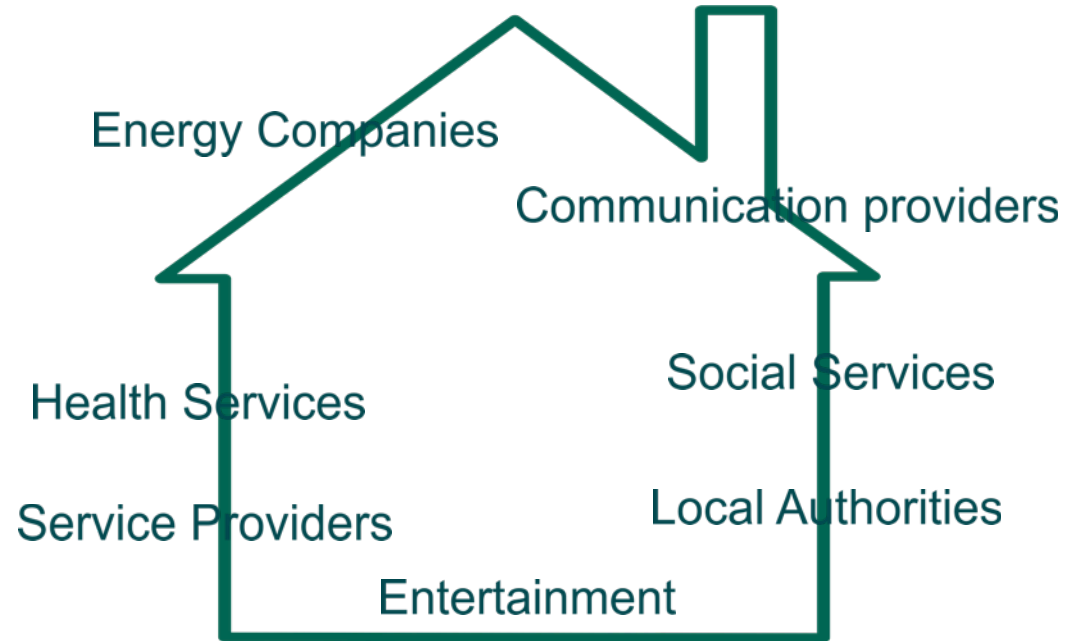
CENELEC TS50560 IFRS
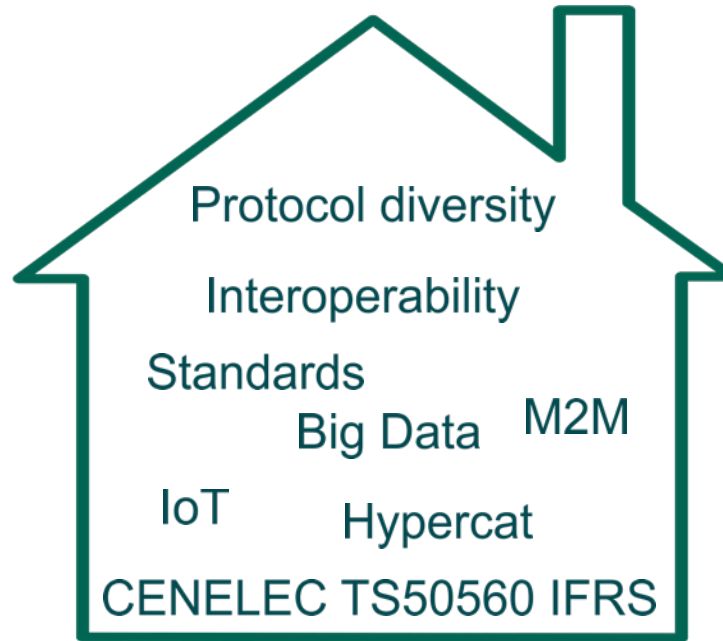
What makes our Homes and Buildings Smart?

SMART SYSTEMS
SYSTEM ELEMENTS
SYSTEM SUPPLIERS
CONSIDERATIONS
EXTERNALITIES

Political Aspects

Economic Aspects

Growth & Jobs

Unintended consequences

Inputs and outputs

Flows for IODiCUS Localised Energy System project starting January 1st 2015

Interoperable Open Digital Control Unit System

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JUST SOME OF THE THINGS IN YOUR "SMART" HOUSE?

TAHI INTEROPERABILITY FOR SMART HOMES AND COMMUNITIES

INTEROPERABILITY FRAMEWORK

GENERAL REQUIREMENTS

THE TOA SERVICE SUPPLY CHAIN

DEFINES THE SERVICE
- CONTENT CREATOR
- CONTENT PROVIDER
- CONTENT AGGREGATOR
- SERVICE CREATOR
- SERVICE AGGREGATOR
- SERVICE PROVIDER
- SERVICE OPERATOR
- NETWORK OPERATOR
- CONTENT DISTRIBUTOR
- SUBSCRIBER
- END USER
DEFINES USER INTERFACE

STANDARD DESCRIPTION OF SUPPLY CHAIN ENTITIES

DESCRIPTOR TABLE
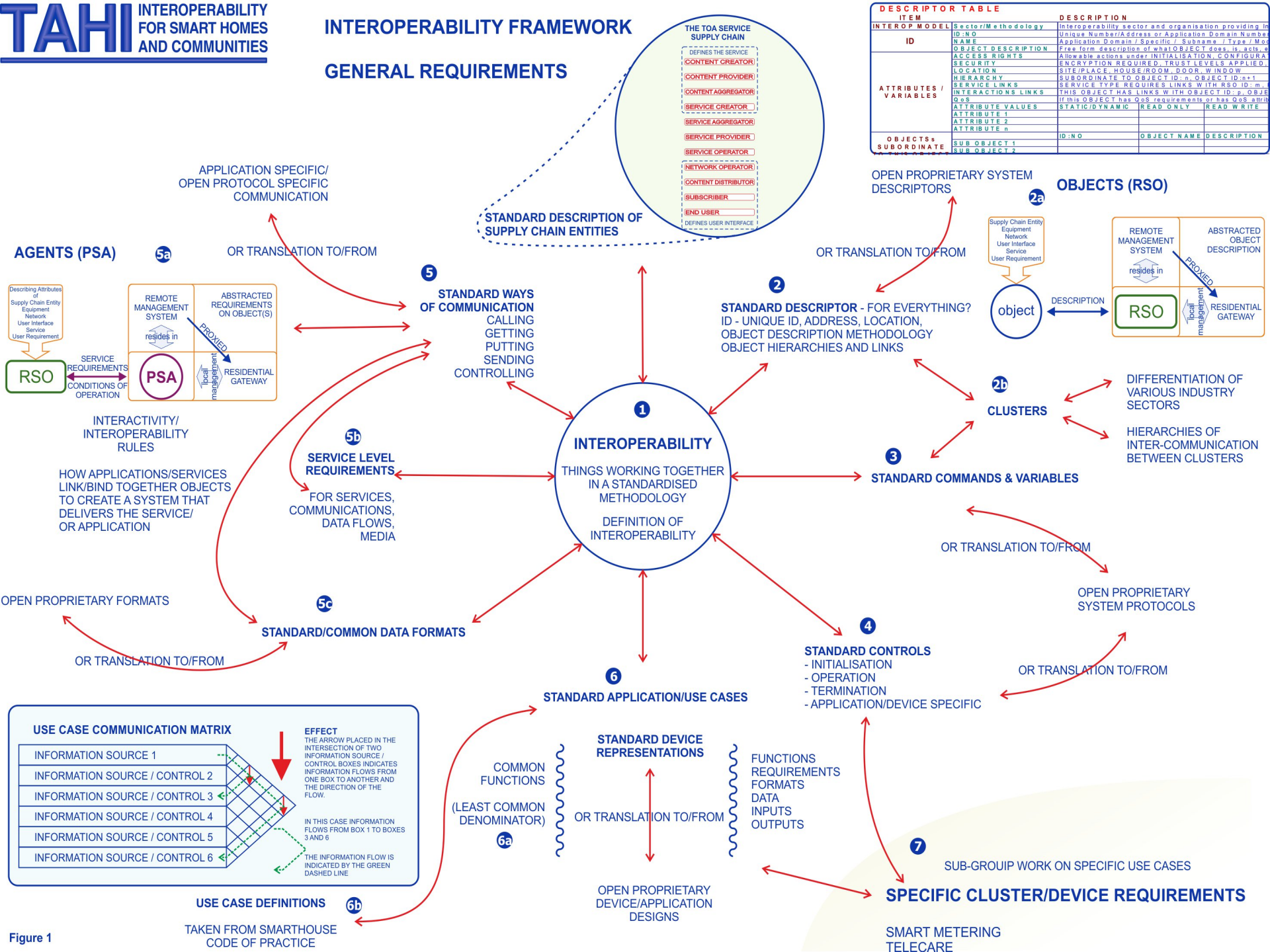
INTEROP MODEL	ITEM	DESCRIPTION
ID	Sector/Methodology	Interoperability sector and organisation providing In
	ID : NO	Unique Number/Address or Application Domain Number
	NAME	Application Domain / Specific / Subname / Type / Mod
	OBJECT DESCRIPTION	Free form description of what OBJECT does, is, acts, e
ATTRIBUTES / VARIABLES	ACCESS RIGHTS	Allowable actions under INITIALISATION, CONFIGURA
	SECURITY	ENCRYPTION REQUIRED, TRUST LEVELS APPLIED.
	LOCATION	SITE / PLACE, HOUSE / ROOM, DOOR, WINDOW
	HIERARCHY	SUBORDINATE TO OBJECT ID : n, OBJECT ID : n+1
	SERVICE LINKS	SERVICE TYPE REQUIRES LINKS WITH RSO ID : m
	INTERACTIONS LINKS	THIS OBJECT HAS LINKS WITH OBJECT ID : n, OBJE
	QoS	If this OBJECT has QoS requirements or has QoS attri
	ATTRIBUTE VALUES	STATIC/DYNAMIC, READ ONLY, READ WRITE
	ATTRIBUTE 1	
	ATTRIBUTE 2	
	ATTRIBUTE n	
OBJECTSs SUBORDINATE TO THIS OBJECT		ID : NO, OBJECT NAME, DESCRIPTION
	SUB OBJECT 1	
	SUB OBJECT 2	

OBJECTS (RSO)

2a

REMOTE MANAGEMENT SYSTEM — resides in
ABSTRACTED OBJECT DESCRIPTION
PROXIED
RESIDENTIAL GATEWAY
local management

object — DESCRIPTION — RSO

OPEN PROPRIETARY SYSTEM DESCRIPTORS

OR TRANSLATION TO/FROM

AGENTS (PSA)

5a

Describing Attributes of Supply Chain Entity Equipment Network User Interface Service User Requirement

REMOTE MANAGEMENT SYSTEM — resides in
ABSTRACTED REQUIREMENTS ON OBJECT(S)
PROXIED
RESIDENTIAL GATEWAY
local management

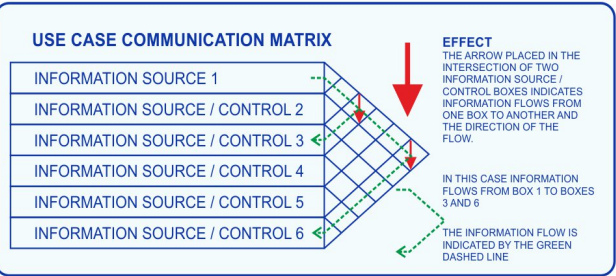RSO — SERVICE REQUIREMENTS / CONDITIONS OF OPERATION — PSA

INTERACTIVITY/ INTEROPERABILITY RULES

HOW APPLICATIONS/SERVICES LINK/BIND TOGETHER OBJECTS TO CREATE A SYSTEM THAT DELIVERS THE SERVICE/ OR APPLICATION
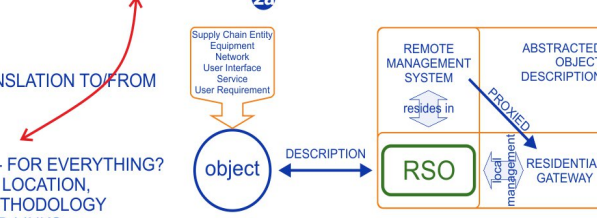
APPLICATION SPECIFIC/ OPEN PROTOCOL SPECIFIC COMMUNICATION

OR TRANSLATION TO/FROM

5 STANDARD WAYS OF COMMUNICATION
CALLING
GETTING
PUTTING
SENDING
CONTROLLING

5b SERVICE LEVEL REQUIREMENTS
FOR SERVICES, COMMUNICATIONS, DATA FLOWS, MEDIA

1 INTEROPERABILITY
THINGS WORKING TOGETHER IN A STANDARDISED METHODOLOGY
DEFINITION OF INTEROPERABILITY

2 STANDARD DESCRIPTOR - FOR EVERYTHING?
ID - UNIQUE ID, ADDRESS, LOCATION, OBJECT DESCRIPTION METHODOLOGY OBJECT HIERARCHIES AND LINKS

2b CLUSTERS

DIFFERENTIATION OF VARIOUS INDUSTRY SECTORS

HIERARCHIES OF INTER-COMMUNICATION BETWEEN CLUSTERS

3 STANDARD COMMANDS & VARIABLES

OR TRANSLATION TO/FROM

OPEN PROPRIETARY SYSTEM PROTOCOLS

OR TRANSLATION TO/FROM

OPEN PROPRIETARY FORMATS

OR TRANSLATION TO/FROM

5c STANDARD/COMMON DATA FORMATS

4 STANDARD CONTROLS
- INITIALISATION
- OPERATION
- TERMINATION
- APPLICATION/DEVICE SPECIFIC

USE CASE COMMUNICATION MATRIX

- INFORMATION SOURCE 1
- INFORMATION SOURCE / CONTROL 2
- INFORMATION SOURCE / CONTROL 3
- INFORMATION SOURCE / CONTROL 4
- INFORMATION SOURCE / CONTROL 5
- INFORMATION SOURCE / CONTROL 6

EFFECT
THE ARROW PLACED IN THE INTERSECTION OF TWO INFORMATION SOURCE / CONTROL BOXES INDICATES INFORMATION FLOWS FROM ONE BOX TO ANOTHER AND THE DIRECTION OF THE FLOW.

IN THIS CASE INFORMATION FLOWS FROM BOX 1 TO BOXES 3 AND 6

THE INFORMATION FLOW IS INDICATED BY THE GREEN DASHED LINE

6 STANDARD APPLICATION/USE CASES

STANDARD DEVICE REPRESENTATIONS

COMMON FUNCTIONS

(LEAST COMMON DENOMINATOR)

6a

OR TRANSLATION TO/FROM

FUNCTIONS REQUIREMENTS FORMATS DATA INPUTS OUTPUTS

OPEN PROPRIETARY DEVICE/APPLICATION DESIGNS

USE CASE DEFINITIONS
6b
TAKEN FROM SMARTHOUSE CODE OF PRACTICE

7 SPECIFIC CLUSTER/DEVICE REQUIREMENTS

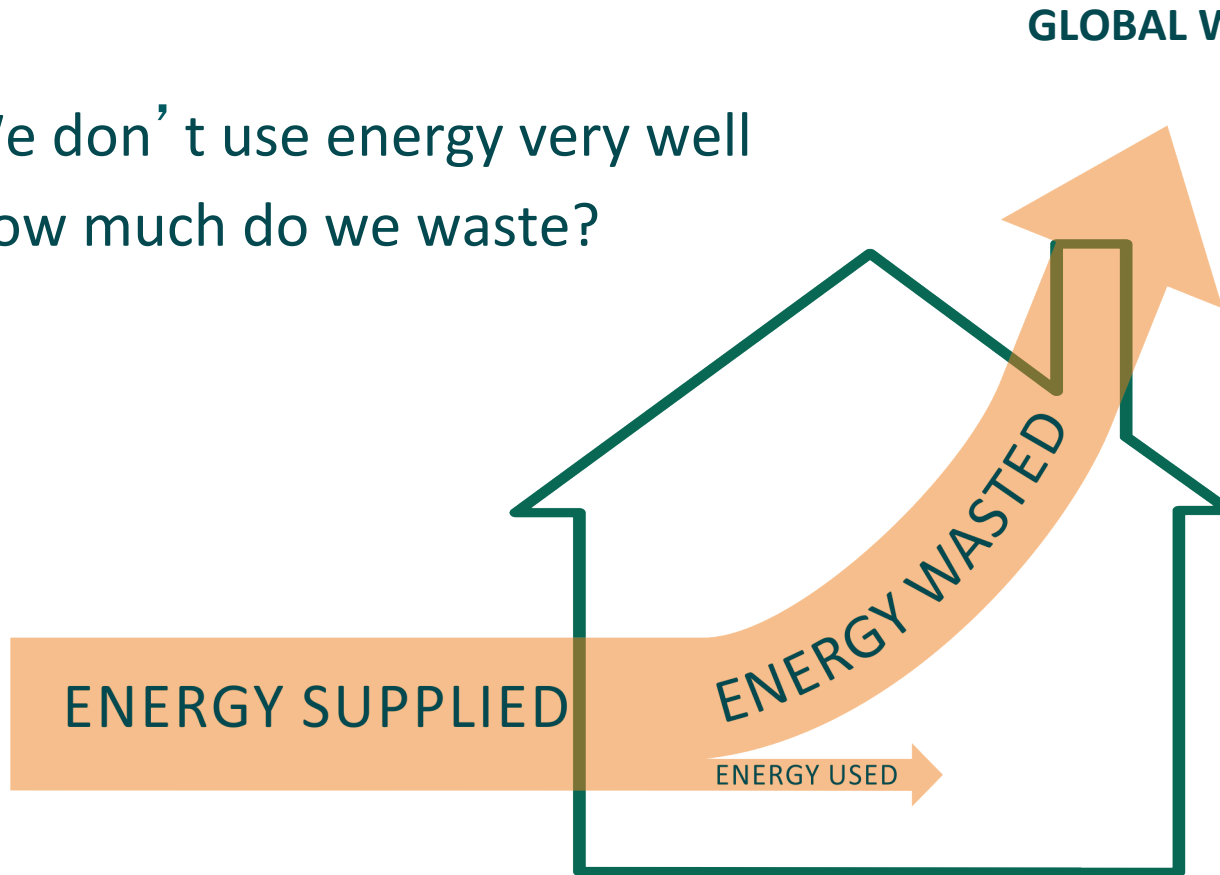SUB-GROUP WORK ON SPECIFIC USE CASES

SMART METERING
TELECARE

Figure 1

It's not just things

- We don't use energy very well
- How much do we waste?

GLOBAL WARMING

ENERGY SUPPLIED

ENERGY WASTED

ENERGY USED

Compared to PassivHaus our building stock uses 80% more than it needs to.

This represents £30 Billion per year – wasted?

We have to reduce our carbon emissions to 20% of 1995 levels by 2050

SH&BA looked at a project to address this – but systems in the house were only part of the solution. Industrial refurbishment was.

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The SH&BA / BRE 20 20 20 Rapid Retrofit project

- To reduce energy consumption in homes to 20% of current
- To do the work in 20 days
- To do it for an average cost of £20k
- Over 30 years to 2050
- Needs a Smart but complex system

- We need a "Tier 1" organisation to take this forward under AMSCI round 4.
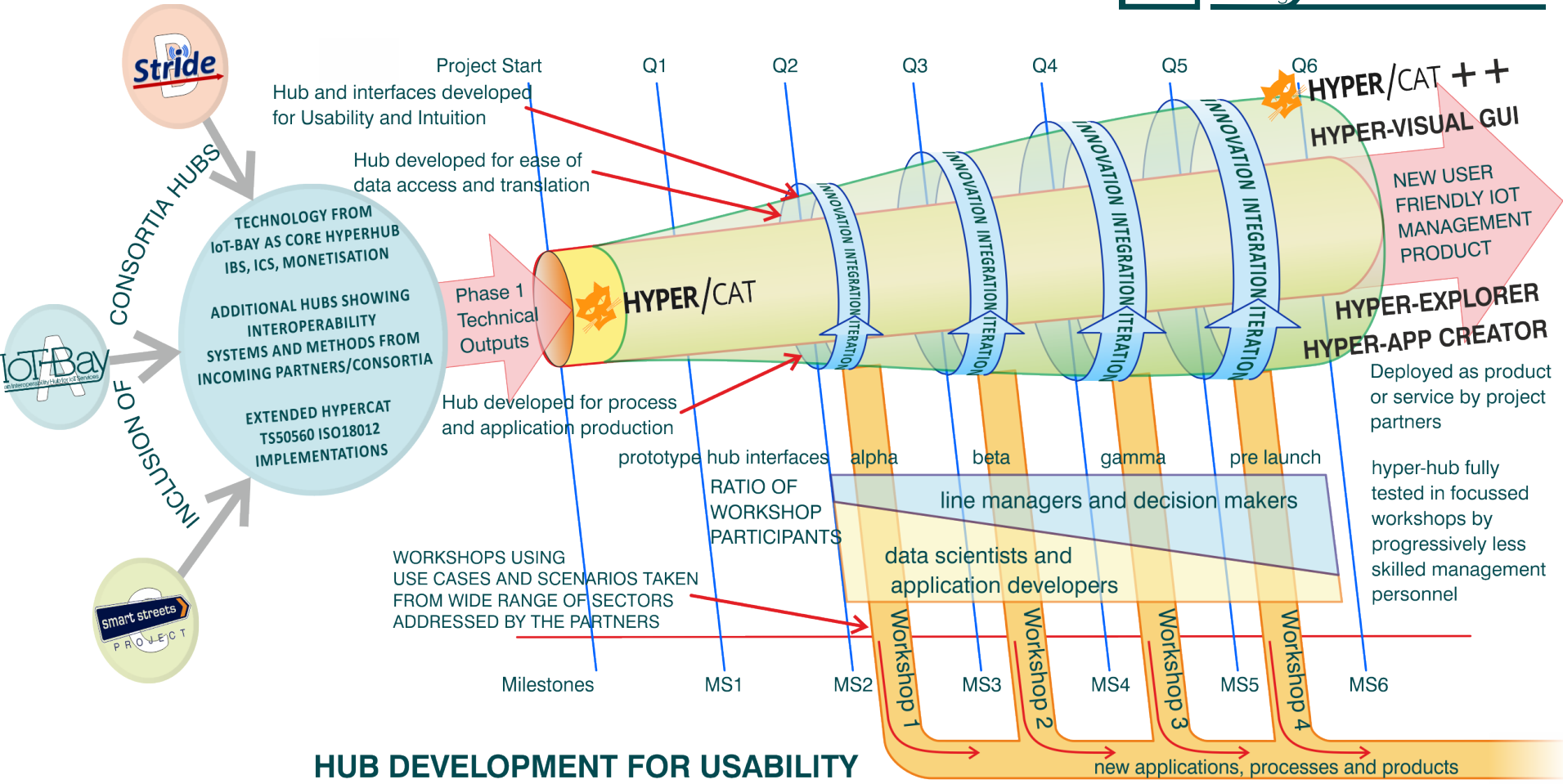
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20 20 20 RAPID RETROFIT PROJECT
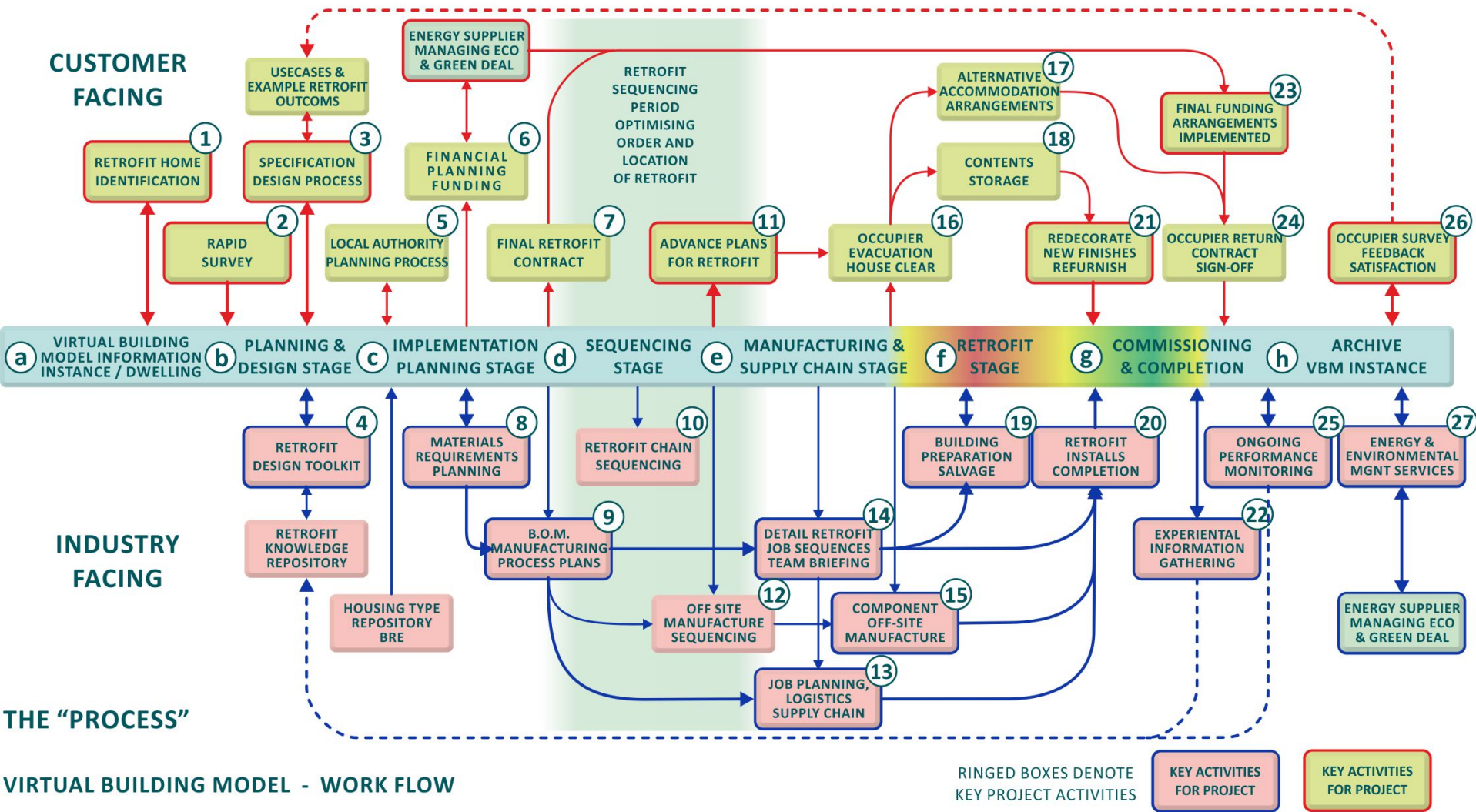
While most of this potential project is materials and work, there is an expectation of high technical systems input
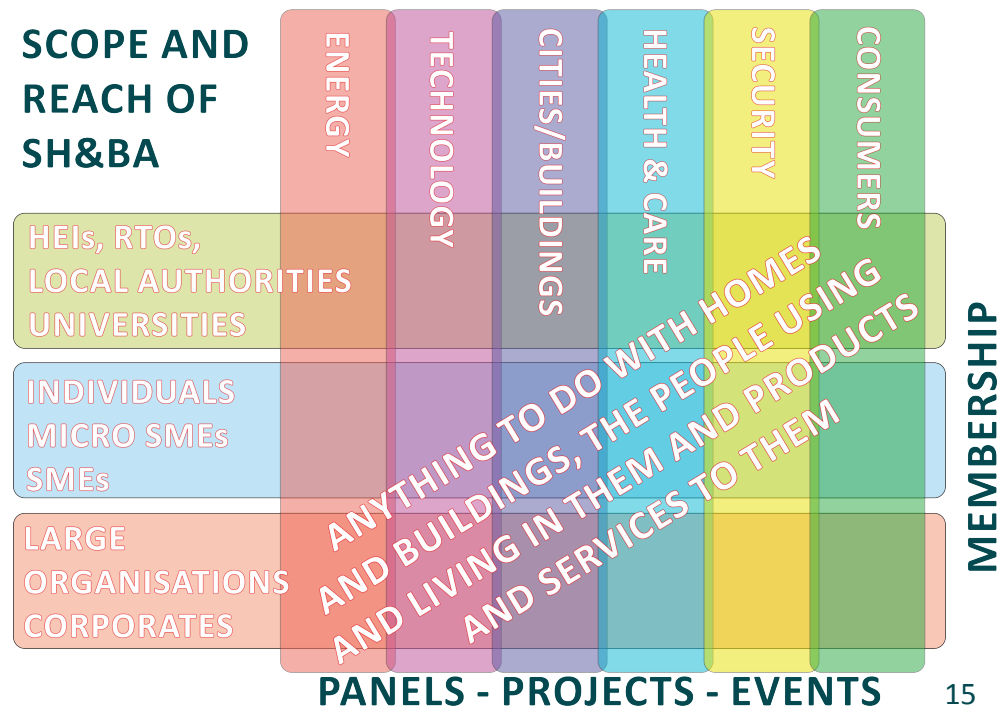
IoT-Bay

- One of 8 Ecosystem Demonstrator projects
  - Set in and around Westminster – IoT for the City – Energy and Assets
  - IoT Interoperability was key (IFRS and Hypercat)
  - Apps such as Catalogue Explorer for searching IoT Assets
- What did we find?
  - IoT is not that easy. Getting to the assets and data is hedged in with access and permissions and multiple systems and protocols
  - Using the information requires serious IT skills – IoT is not currently accessible for people in businesses and organisations
  - IoT needs to be made easy
- Phase 2 Bid – EASY-IoT - Making IoT Mainstream for Business
  - All about easy to use IoT, jobs and growth

HUB DEVELOPMENT FOR USABILITY

We'd like to take EASY-IoT into H2020 under ICT30

Smart Complexity in the built environment

- This session looks at many of the issues
- Home and Building systems have to be Smart and cover multiple sectors which may not interoperate
- SH&BA covers the technology, consumers, energy, health, security and cities.
- www.shaba.eu

SCOPE AND REACH OF SH&BA

ENERGY · TECHNOLOGY · CITIES/BUILDINGS · HEALTH & CARE · SECURITY · CONSUMERS

HEIs, RTOs, LOCAL AUTHORITIES UNIVERSITIES

INDIVIDUALS MICRO SMEs SMEs

LARGE ORGANISATIONS CORPORATES

ANYTHING TO DO WITH HOMES AND BUILDINGS, THE PEOPLE USING AND LIVING IN THEM AND PRODUCTS AND SERVICES TO THEM

MEMBERSHIP

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Smart Homes and Buildings Association

PANELS - PROJECTS - EVENTS

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SESSION 1 – Stan Boland, CEO - Neul