

How can we renovate deeply if we don't know what it is?

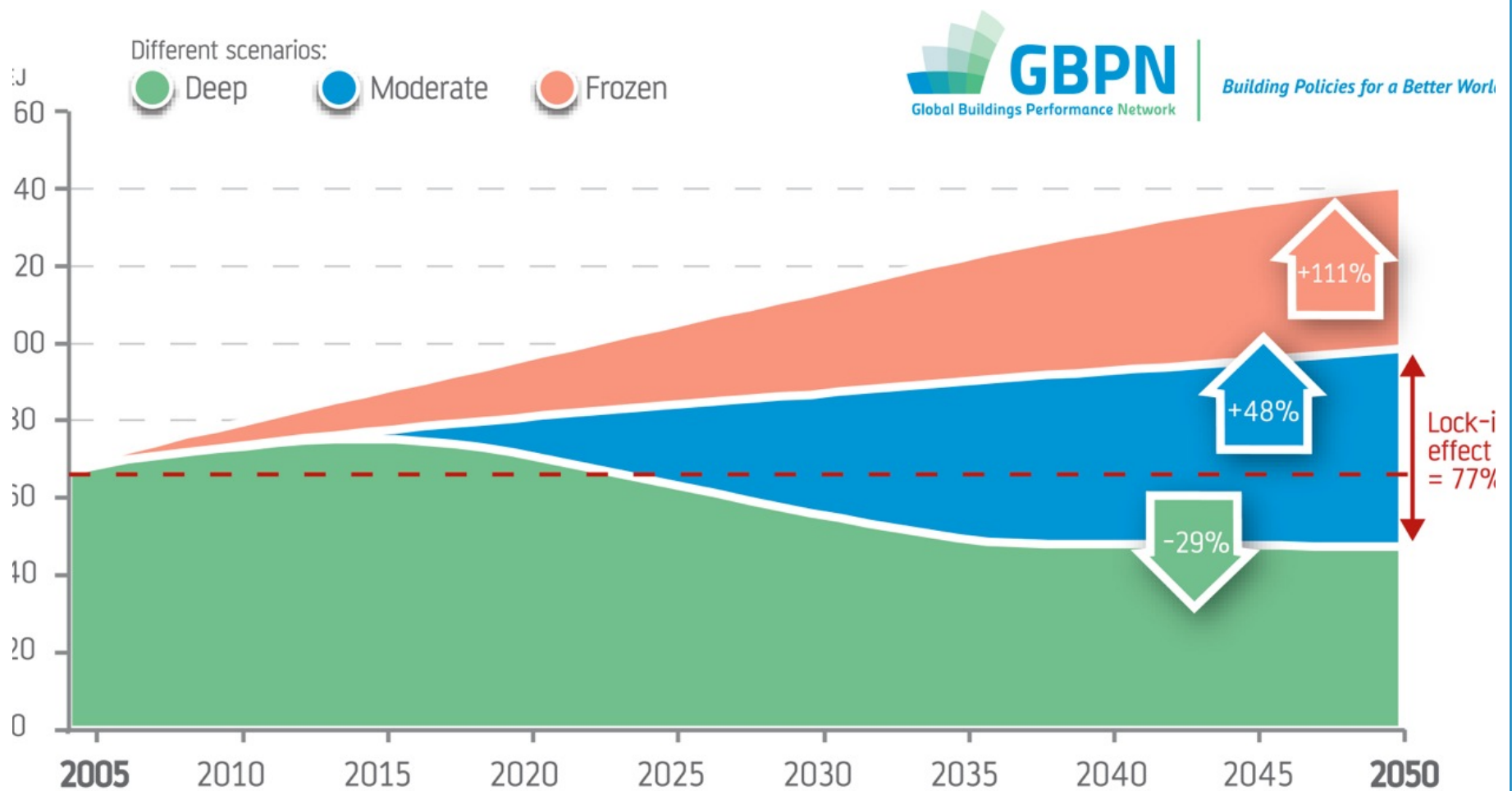
Sophie Shnapp
At ECEEE Summer Study, June 2013



Existing Buildings: Importance

- ‘Deep’ scenario
- EE improvements - standard practice for all renovations - UPSCALE
- Deep potential – 30% reduction in global final energy use by 2050
- EU - 70% potential savings in 2050
- US – 65% potential savings in 2050
- State-of-the-art energy renovation: reduce the energy consumption by >75%
- Early stage of market uptake; this is confirmed by the confusion that arises when trying to define a “deep renovation”

'Deep' scenario



Current DR Definitions

No global/regional harmonised DR definition

- EU use term “Renovate”
- US use term “Retrofit”
- No harmonised definition

Oxford Dictionary Meaning:

- Renovate: Restore (something old) to a good state of repair.
- Retrofit: Fit with a component or accessory not fitted during manufacture
- Refurbish: Renovate and redecorate – derivatives

Methodology for defining DR

1. Literature Review
2. Selection of experts
 - 30 experts from 6 regions
 - China, Europe, India, Latin America, South-East Asia and US
3. Webinar #1 Definition ideas
4. Survey on Definitions
5. Webinar #2 Results and definition approval
6. Deep renovation definitions finalised

Regional context: the EU

EPBD

ARTICLE 4: MS to ensure that minimum energy performance requirements are set with a view to achieving cost-optimal levels applies to existing as well as new buildings.

ARTICLE 7: Buildings subject to a major renovation need have their energy performance improved to meet minimum performance requirements.

ARTICLE 9: Stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings.

EED

ARTICLE 4: MS long-term strategy for mobilizing investment in the renovation (*Inc. cost-effective deep renovation*).

ARTICLE 5: 3% of the total floor area of central government must be renovated each year to meet min energy performance reqs.

Regional context: the US

The Federal Government Buildings

- Federal Energy Management Program
- Pilot projects by the General Services Administration.
- Energy Policy Act 2005 – *Federal Energy Management and Planning Programs* procedures for determining the life-cycle cost-effectiveness of energy conservation measures & set priorities for energy conservation measures in retrofits of existing Federal buildings.
- Energy Independence and Security Act 2007 - Each Federal agency to ensure that major replacements of installed equipment, renovation or expansion of existing space employ the most energy-efficient designs, systems, equipment, and controls

DOE

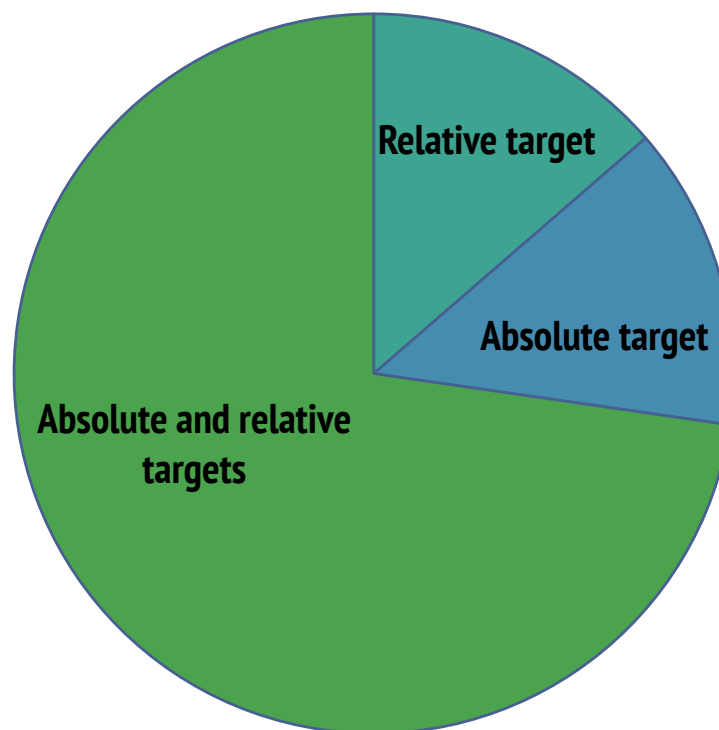
- Programs/guides to reduce energy consumption from existing buildings – Advanced Energy Retrofit Guides (AERG)
- EE Conservation Grant – encourages states to draft EE conservation strategies
- Better Buildings Initiative – 20% red by 2020 portfolio of buildings

UTILITY

- Deep retrofits are supported most by utility (electric and gas supply) companies at the local level

RESULTS OF THE SURVEY

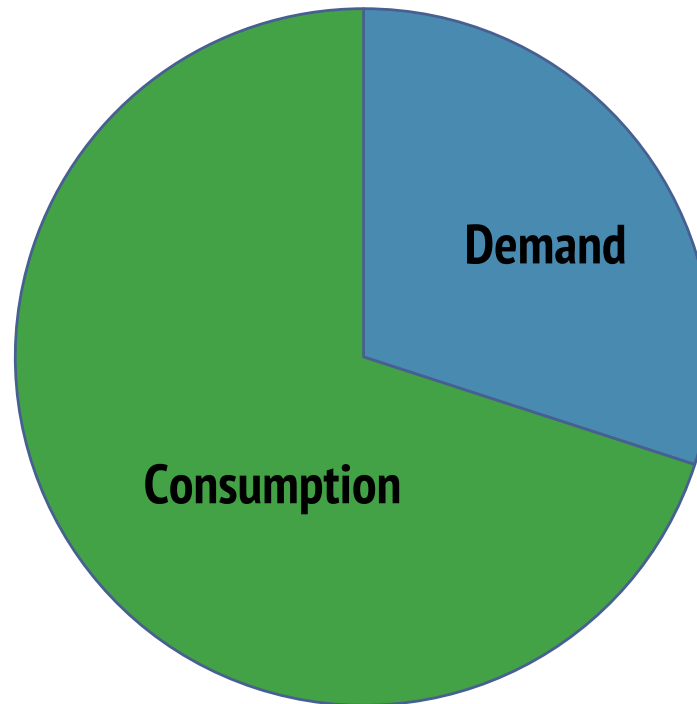
Q1. Should policies set absolute or relative targets for savings?



Around 75% of the respondents think that policies should set both relative and absolute targets depending on situation.

RESULTS OF THE SURVEY

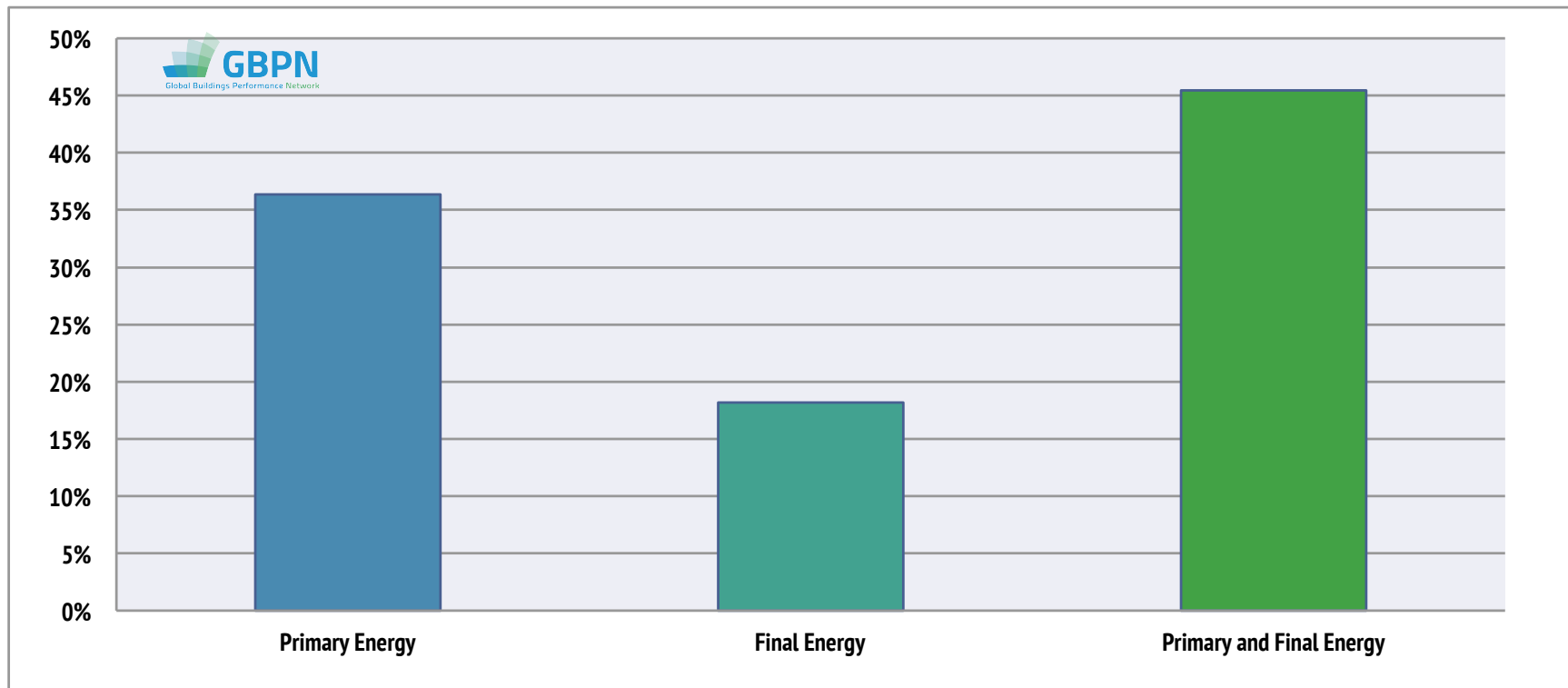
Q2. Should the targets be based on energy demand or energy consumption?



Targets should be expressed in terms of consumption, however, both consumption and demand, are worth considering when defining the targets.

RESULTS OF SURVEY

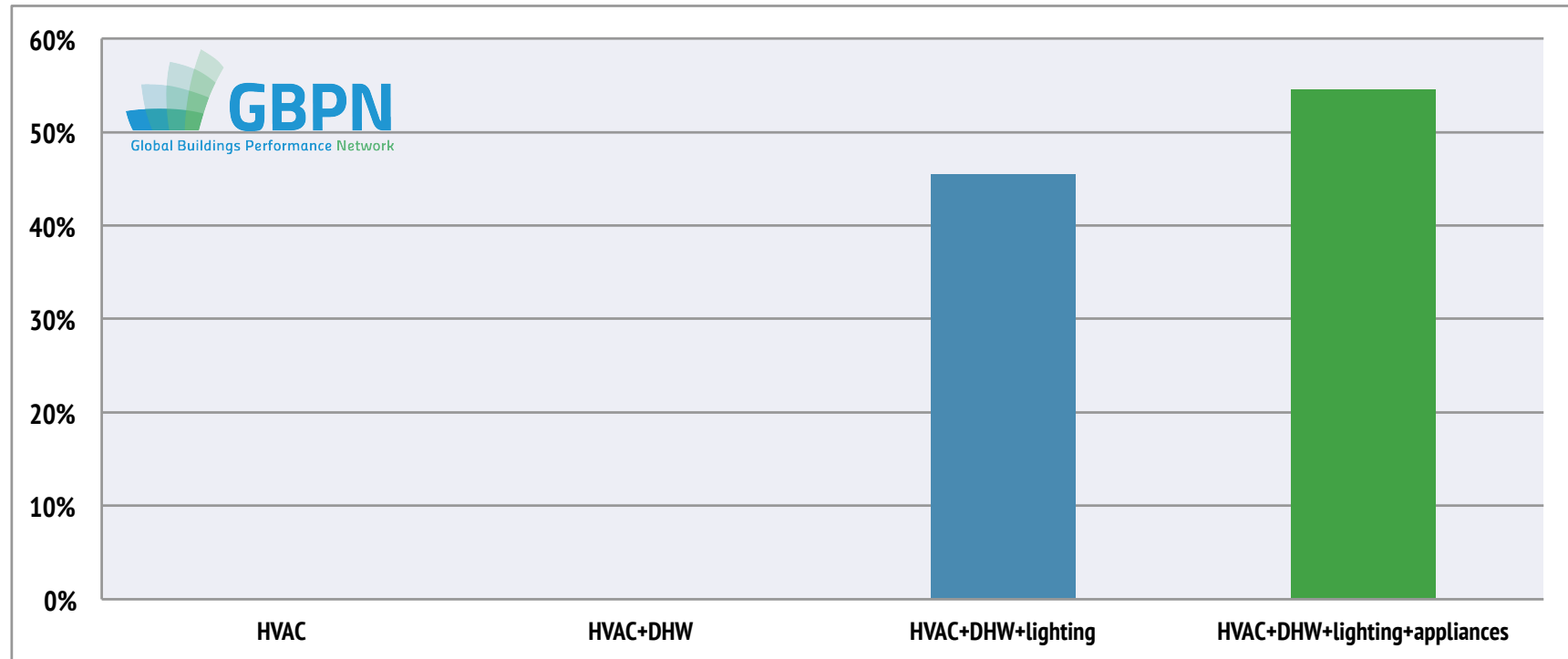
Q3. The energy target should apply to... (Primary or final energy)



Almost 50% of experts would consider using both final and primary energy in the definition of DR

RESULTS OF THE SURVEY

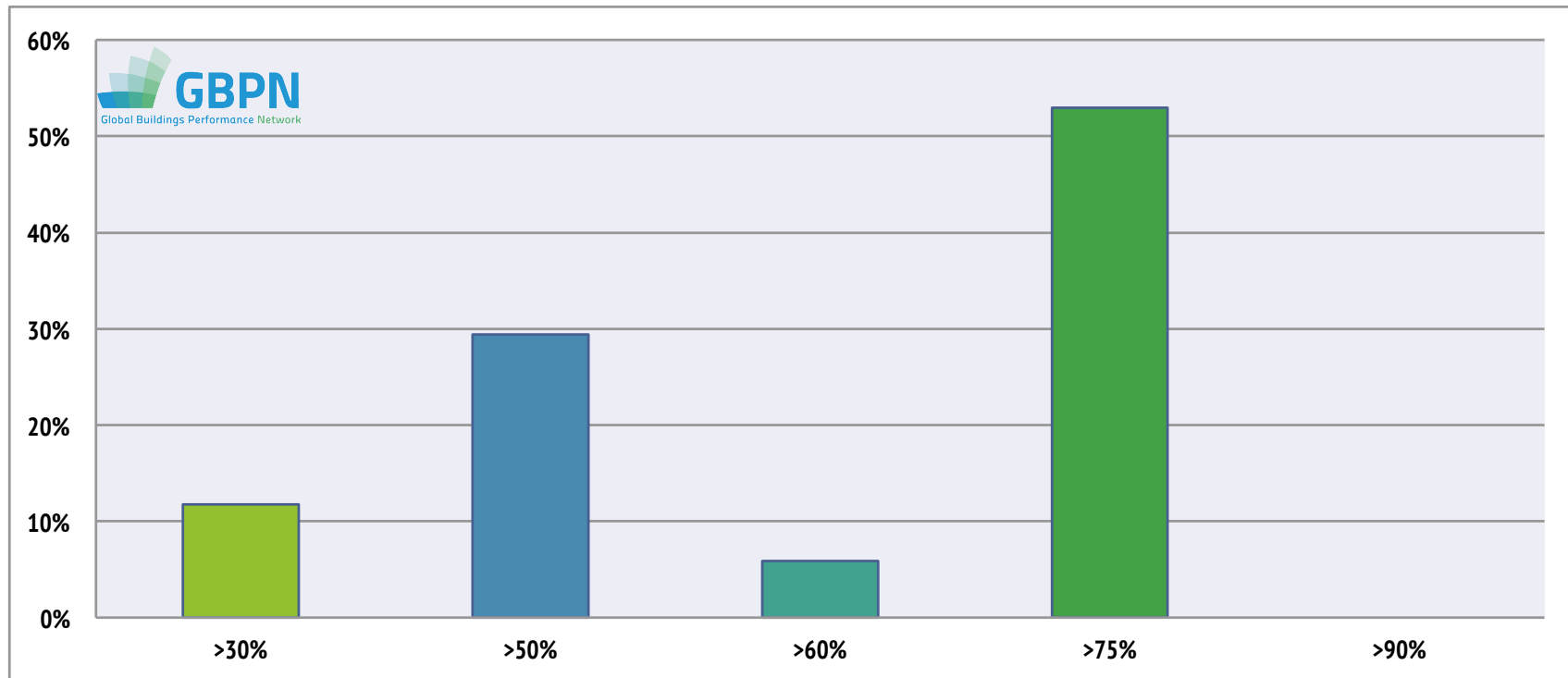
Q4. Energy use should include... (HVAC/DHW/ Appliances/Lighting)



Experts were split between including HVAC+DHW+lighting and HVAC+DHW+lighting +plug loads

RESULTS OF THE SURVEY

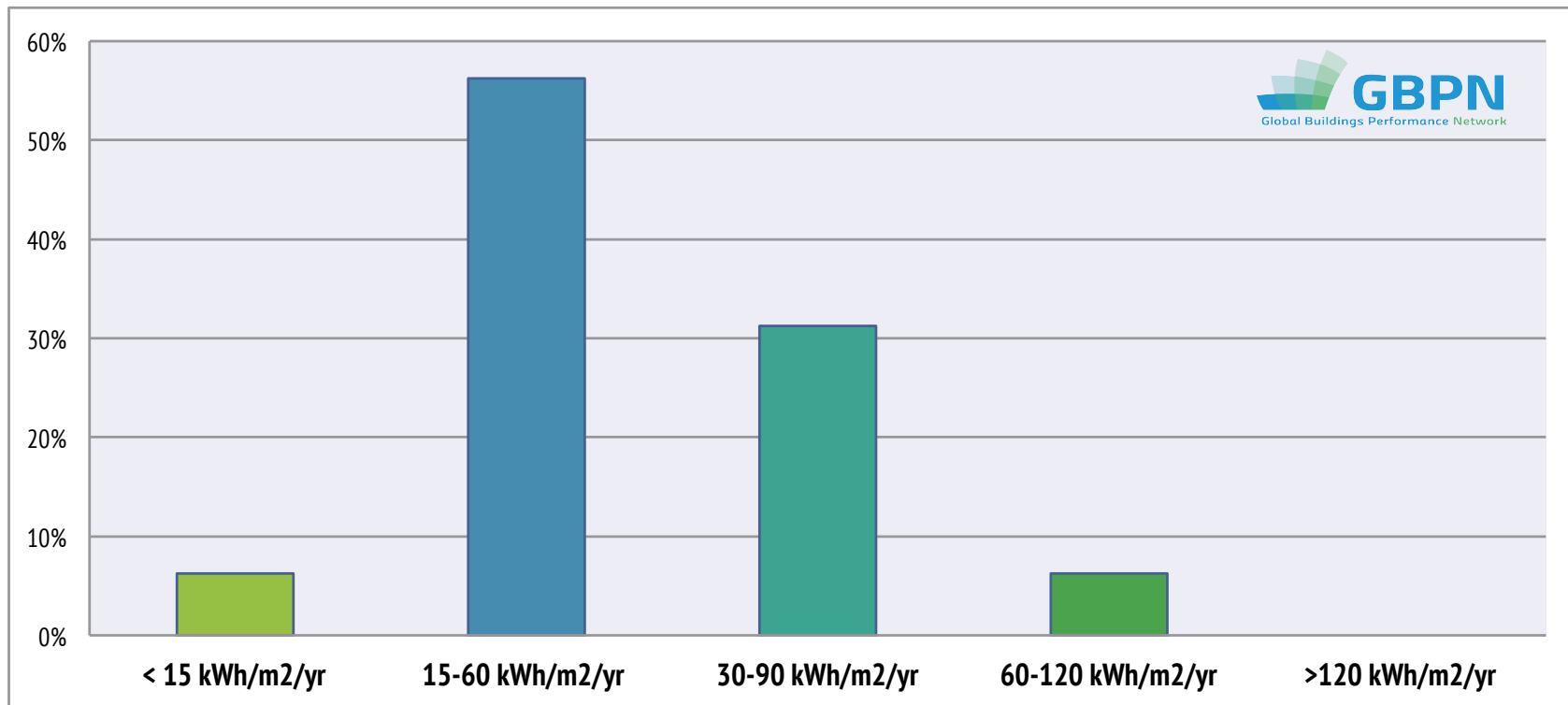
Q5. If a relative energy savings target were considered, what should this target be?



Around 60% think relative target should be higher than 75%.

RESULTS OF THE SURVEY

Q6. What should the final energy consumption (absolute target) be after a deep renovation?



Around 90% of the respondents think the absolute target should be less than 90 kWh/m²/yr. Almost 60% of the respondents think that an absolute target should be between 15-60kWh/m²/yr.

CONCLUSIONS OF THE SURVEY

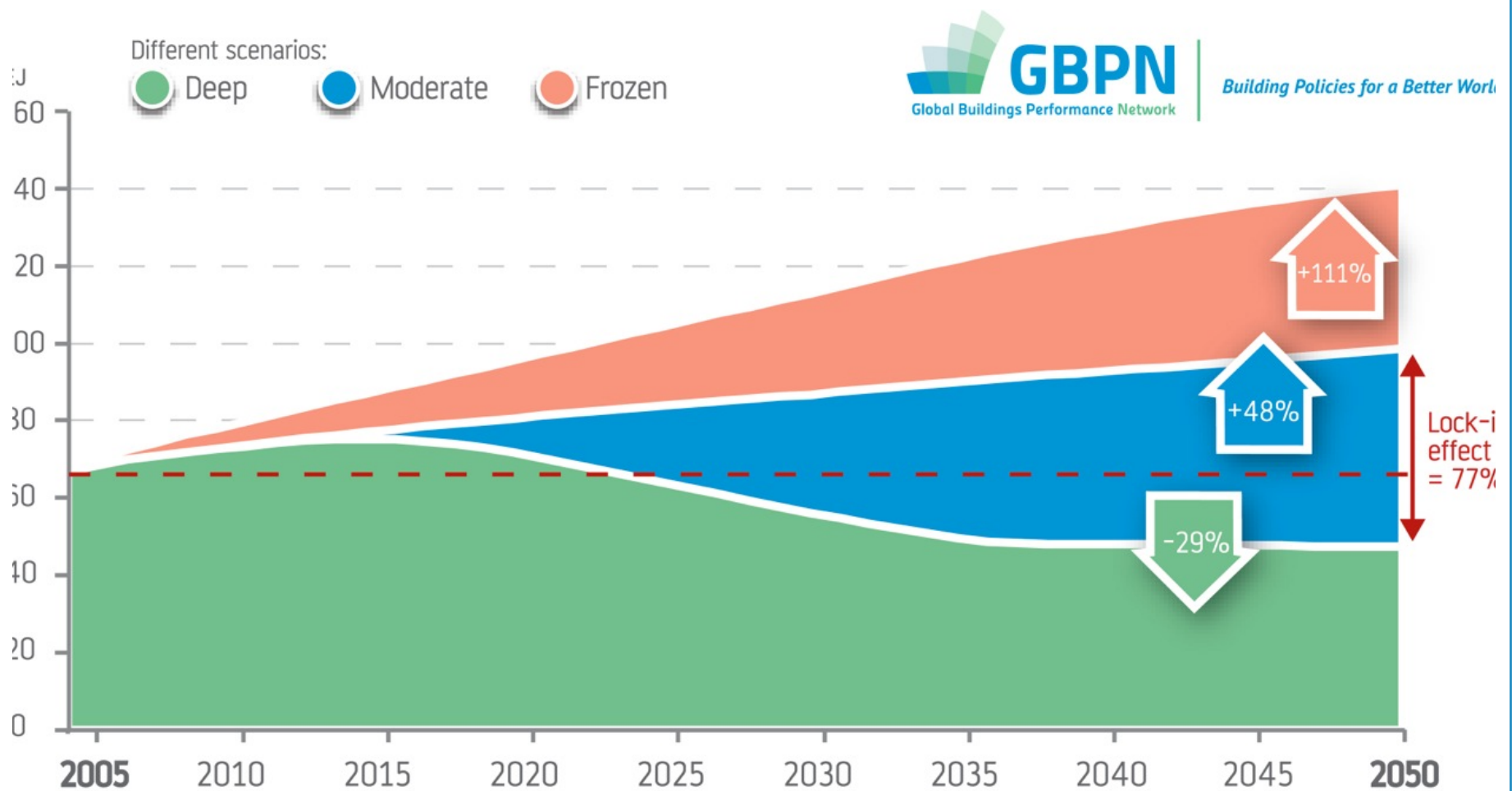
Q7. Which title do you find the most appropriate?

- EU experts chose DEEP RENOVATION
 - Most ambition
 - Full potential of improvement works
 - Primary energy consumption includes HVAC + DHW + lighting
 - 75% reduction and/or have a primary energy consumption after renovation of less than 60 kWh/m²/yr
- US experts chose DEEP RETROFIT
 - Replacing existing systems with similar ones that are of higher quality and performance
 - Primary energy consumption includes HVAC + DHW + lighting + all plug loads
 - Improvement in the range of 30% – 50%

Oxford Dictionary Meaning:

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'Deep' scenario

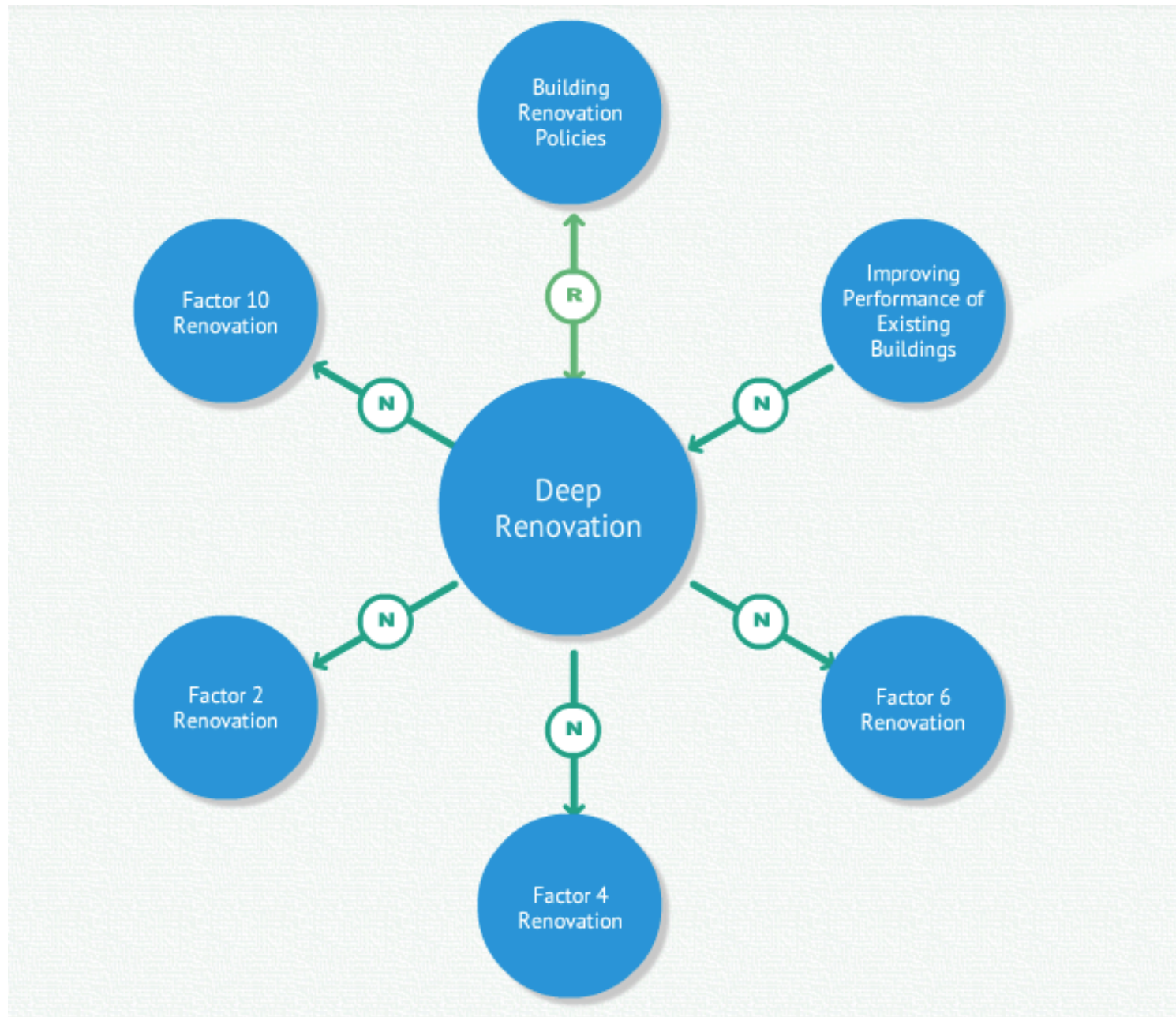


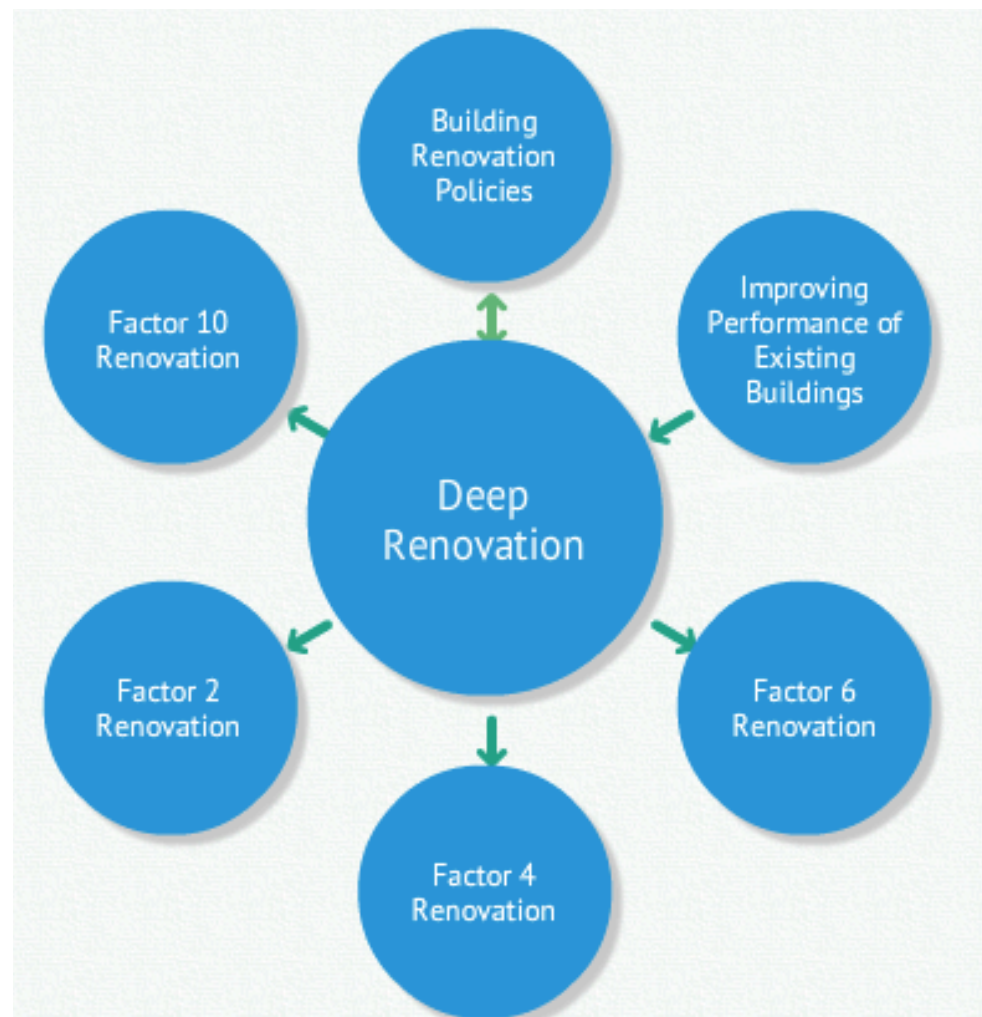
Relative DR Definitions

- **Factor Two or Factor 2 Renovation:** A renovation with energy consumption reductions of 50% compared to pre-renovation performance.
- **Factor Four or Factor 4 Renovation:** A deep renovation with energy consumption reductions of 75% compared to pre-renovation performance.
- **Factor Six or Factor 6 Renovation:** A deep renovation with energy consumption reductions of 84% compared to pre-renovation performance.
- **Factor Ten or Factor 10 Renovation:** A deep renovation with energy consumption reductions of 90% compared to pre-renovation performance.

GBPN Thesaurus







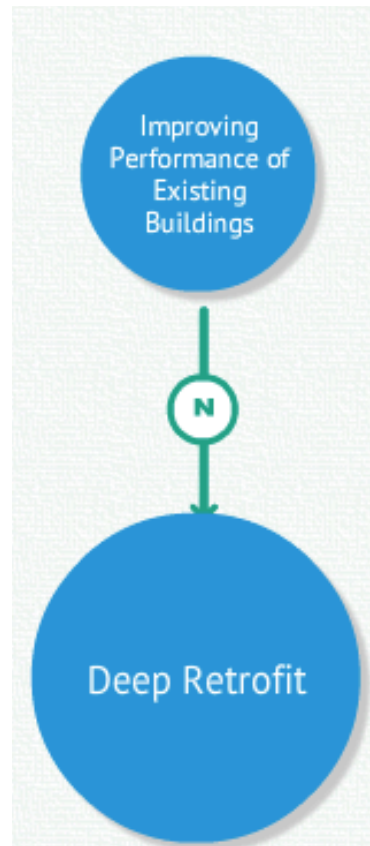
Deep Renovation

Synonyms: Deep Energy Renovation

Deep Renovation or Deep Energy Renovation is a term for a building renovation that captures the full economic energy efficiency potential of improvements. This typically includes a focus on the building shell of existing buildings in order to achieve very high-energy performance. The renovated building consumes 75% less primary energy compared to the status of the existing building before the renovation. The energy consumption after renovation for heating, cooling, ventilation, hot water and lighting, is less than 60 kWh/m²/yr. (Definition often used in Europe) [Source: GBPN, 2012]

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Deep Retrofit

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Synonyms: Deep energy retrofit

Deep retrofit or Deep Energy Retrofit implies replacing existing systems in a building with similar ones that are of higher quality and performance, which leads to a better energy performance of an existing building. The primary energy consumption includes energy used for heating, cooling, ventilation, hot water, lighting, installed equipment and appliances. After the deep retrofit the buildings consume 50% less primary energy compared to the status of the existing building/s the retrofit (Definition mainly used in US). [Source: GBPN, 2012]

GBPN's resources

- Knowledge platform
- The “Laboratory on More and Deeper Renovation”
- Discussion forum and an interactive research tool
- GBPN Thesaurus
- www.gbpn.org

Thank you!

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