

Welcome to the ICP Technical Forum Webinar

Using the control panel provided, please select your audio preference – either ‘mic and speakers’ if you want to follow the webinar on your computer, or ‘by phone’, if you would like to call in. Please follow the directions given.

The control panel can also be used for the following during the webinar:

- If you would like to ask a question, please click on the hand icon or ‘call out’ at the bottom of the tool bar. This will go red and alert the presenter that you want to speak.
- Alternatively, if you would like to write a question or comment, there is a text box that you can expand or shrink using the arrow at the top of the tool bar.



The presentation will start today at 15:05 (CET)

This presentation will be recorded.



Investor Confidence Project Europe

Technical Forum

October 29th, 2015

Luís Castanheira, ICP Europe Technical Director



Welcome to the ICP Europe 3rd Technical Forum

Agenda:

- ICP – US update
- ICP Europe – Tech Forum update and new guidance on how to apply the protocols
- LTB and STB status update
- Targeted Tertiary and Apartment Blocks presentation
- Annex A - update on research
- Project Development Specification outline
- Next steps and your participation

Welcome to the ICP Europe 3rd Technical Forum

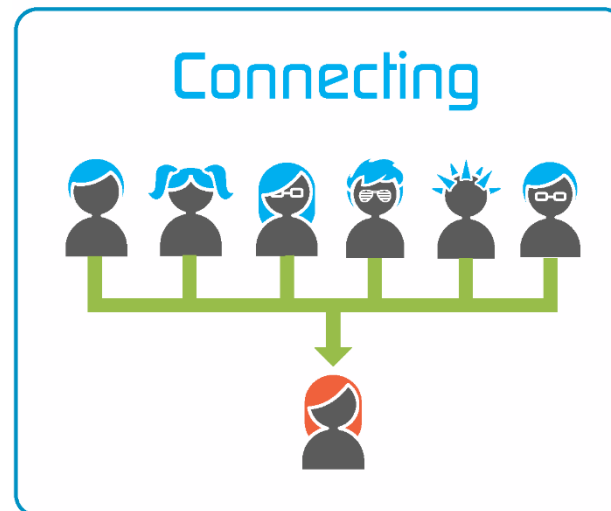
Outcomes

Understanding of:

- Relevant changes on guidance to apply EPP's
- What's new on LTB and STB
- How will Targeted protocols work
- Present situation of Technical Research
- How will PDS be organized
- Next steps and how you can participate

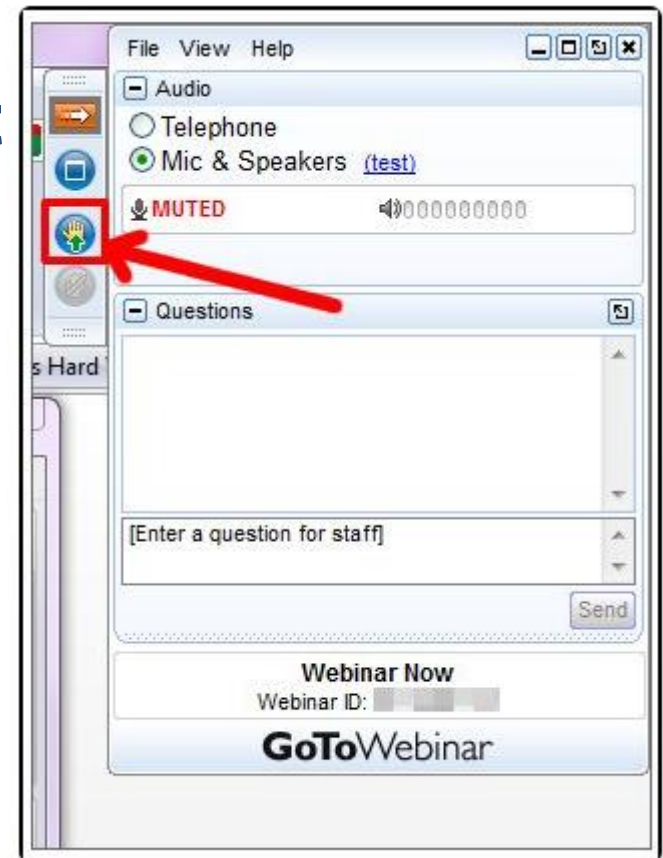
Why goto meeting?

- Promote more interaction between members;
- Allow live questions - hands up;
- Allow the opportunity to members to share/present;
- Other deliveries (e.g. handouts).



If You Do Have Questions During the Webinar.....

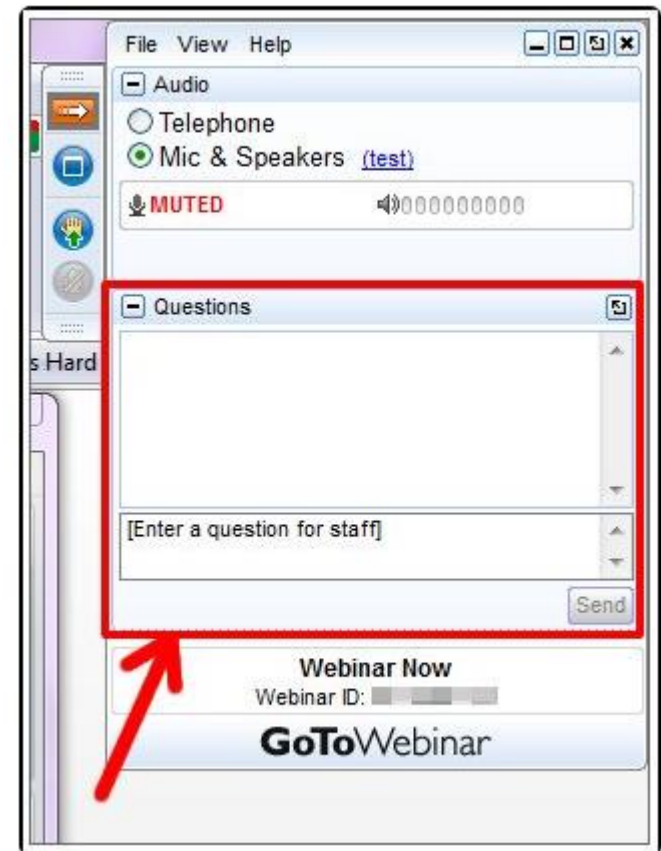
- Q&A session will be held at the end of the presentation
- If you would like to ask a question verbally, please **raise your hand**
- Please don't forget to briefly introduce yourself by stating your name and organisation!



This presentation is being recorded and will be posted at europe.eepperformance.org and emailed to registrants

If You Do Have Questions During the Webinar.....

- Alternatively, you can ask a question by **typing it into the Questions box** on the right hand side of the screen, in the control panel, and we will answer it at the end



This presentation is being recorded and will be posted at europe.eepperformance.org and emailed to registrants

ICP and ICP Europe

A critical mismatch has been identified locally and globally in the energy efficiency (EE) markets between project promoters and investors.

Relevant financial sector stakeholders and building owners have identified lack of project standardization as the main market barrier supporting this mismatch.

ICP is seeking to bring this STANDARDIZATION to the market, with a suite of products, implementation procedures and partners.



Help **Governments** reduce
programme process and
costs



Help **Developers**
deliver more bankable
projects



Help **Investors** manage
risk so they can invest in
energy efficiency

United States Update

The bottom of the slide features decorative wavy lines. A thick green wave starts from the left, peaks, and then tapers off towards the right. Below this, a thinner dark blue wave follows a similar path, also starting from the left and tapering off.

New Jersey Latest State to Incorporate ICP Tools!



First Four Projects Achieve Investor Ready Certification



1. Arverne View - Bright Power

Investment	Cost Savings	Percent Savings	Incentives	Simple Payback
\$6,605,651	\$811,593	34.20%	\$1,4 million	6.4 years



2. 2520 College Avenue, Berkeley, CA

Association of Energy Affordability

Investment	Cost Savings	Percent Savings	Incentives	Simple Payback
\$70,350	\$8,130	29% (electric) 19% (gas)	\$36,750	4.1 years



3. First Presbyterian Church Sustainable Real Estate Solutions

Investment	Cost Savings	Percent Savings	Incentives	Simple Payback
\$692,912	\$44,512	13.50%	\$24,016	15 years



4. Maiden Lane -

Investment	Cost Savings	Percent Savings	Incentives	Simple Payback
\$2,136,000	\$419,956	41%	N/A	5.1 years



BOMA Energy Performance (BEPC) toolkit



ICP Europe Technical Forum

Technical forum so far...

- Two forums already held
- Active and crucial participation on ICP product market shaping
- One to one basis communication
- Main body to assure product consistency with market needs and specifics

“ *[Europe needs the] Launch of an EU-wide initiative to develop a common set of procedures and standards for energy efficiency and buildings refurbishment underwriting for both debt and equity investments.* ”

- Energy Efficiency Financial Institutions Group, a European Commission and United Nations Environment Program Financing Initiative Working Group

Technical forum



[ICP EUROPE](#) [COUNTRIES](#) [ALLIES](#) [BLOG](#) [PROTOCOLS](#) [TECHNICAL FORUM](#) [NEWS](#) [N. AMERICA](#)



Technical Forum Call - 24 September, 2015

ICP Europe Technical Forum Meeting. Covered the first drafts of the first two protocols released for the European market, Large Tertiary and Standard Tertiary, Protocol Structure and Project Development Specification. Ongoing European Standards Research results.

[PLAY RECORDING](#)

Technical Forum Call - 30 June, 2015

First ICP Europe Technical Forum Meeting. Details regarding Product Structure and overall scheme. Protocol Structure and Project Development Specification. Initial European Research results. Documentation package.

[PLAY RECORDING](#)

<http://europe.eepperformance.org/call-recordings.html>



A word cloud of European countries on a black background. The words are arranged in a diagonal pattern from the top-left to the bottom-right. The size of each word indicates its frequency or importance. The colors of the words are: Germany (red), Spain (yellow), UK (orange), Belgium (light orange), Italy (pink), Austria (white), Portugal (white), Greece (yellow), Switzerland (white), Netherlands (white), Portugal (white), USA (white), Canada (white), Sweden (white), Ireland (white), Luxembourg (white), Singapore (white), Denmark (white), France (white), Italy (white), Finland (white), and Norway (white).

Belgium

Germany

Spain

UK

Italy

Austria

Portugal

Greece

Switzerland

Netherlands

Portugal

USA

Canada

Sweden

Ireland

Luxembourg

Singapore

Denmark

France

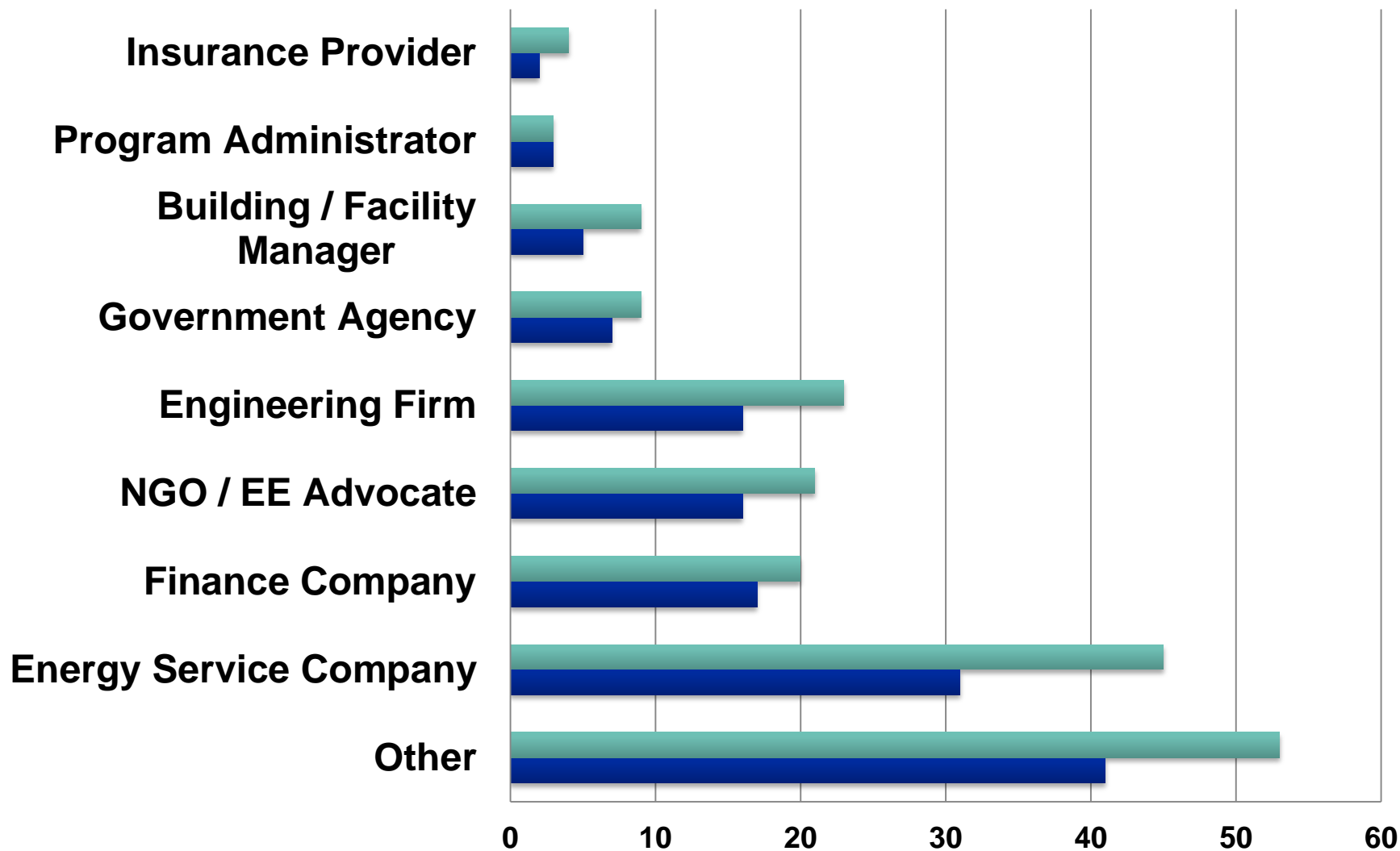
Italy

Finland

Norway

ICP Europe Technical Forum Industry Representation

■ 29-Oct ■ 20-Sep



Technical forum – Participation Benefits

- Members will have the opportunity to shape ICP Europe products to their needs;
- Among the first market actors to have full knowledge about the system;
- Participate with a network of other industry leaders
- Learn about investors and government programmes that are adopting ICP tools first



Energy Performance Protocols

Guidance on application

ICP Europe Protocols Structure

Large Tertiary

Large Apartment
Block

Project capex > €1m, whole building retrofit

Standard Tertiary

Standard Apartment
Block

Project capex < €1m, whole building retrofit

Targeted Tertiary

Targeted Apartment
Block

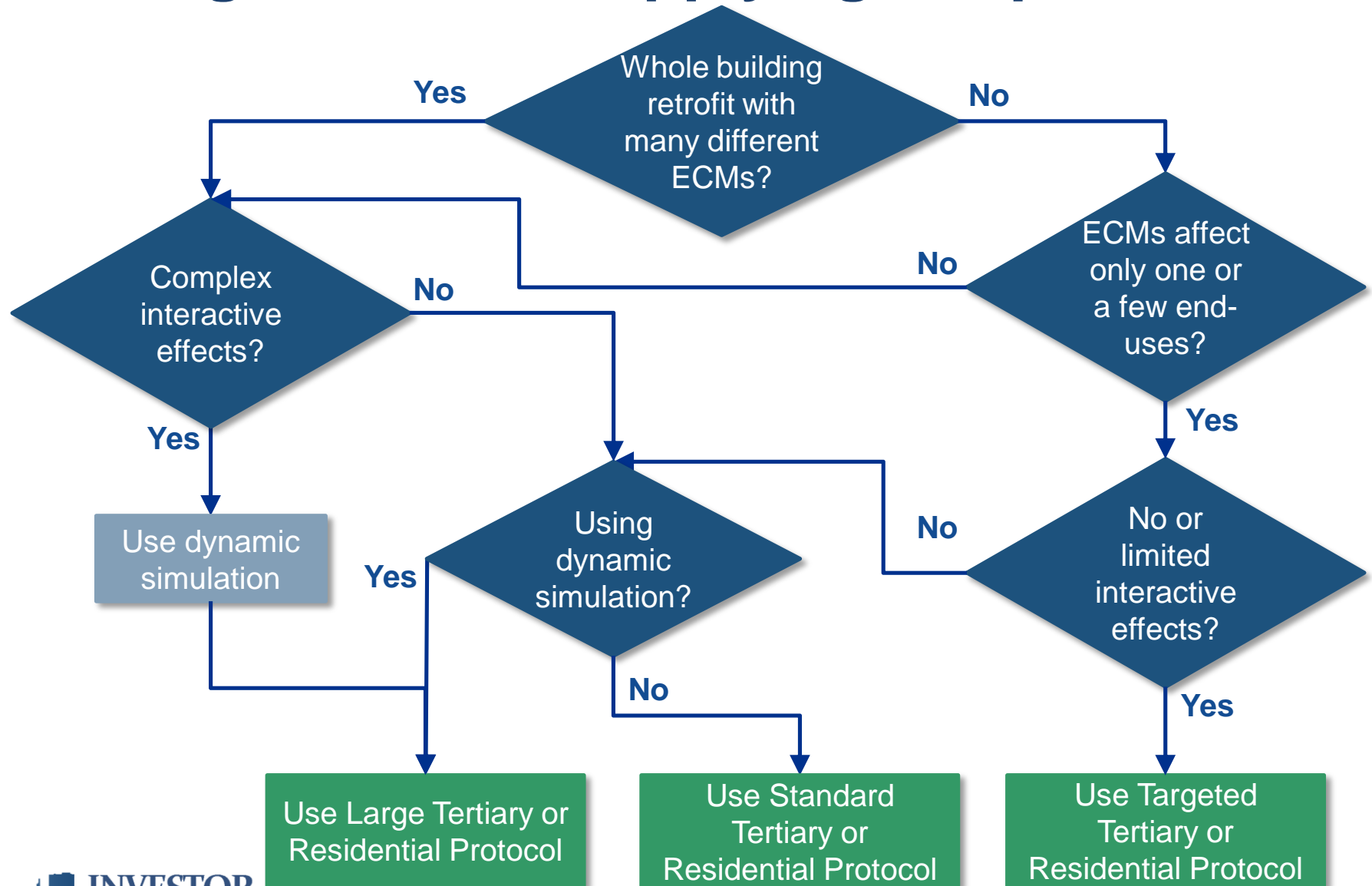
Single or limited number of EE measures

Why are we dropping the 1M€ reference?

Main reasons...

- We may have single measure projects, across a set of buildings with higher capex;
- We could have projects under 1M€ capex, with a relevant number of interacting ECM's;

New guidance on applying the protocols



ICP Europe Product Structure

Protocols do NOT:

- invent new standards
- attempt to impose national standards in another country
- restrict engineering solutions
- define a set level of energy savings



LTB and STB status update

Present situation

- First round of comments finished – second draft issued;
- Second round closing on the 6th of November;
- Some changes made on the basis of your contributions;
- We are still receiving inputs from stakeholders and believe there is space for additional streamlining...

What has changed?

Key changes to second drafts of both LT and ST protocol include:

- Added glossary of key terms
- Guidance on national standards is now a separate annex
- Removed references to *ISO 50002 Energy audits – Requirements with guidance for use* – currently, its Annex doesn't conform to EU Directives - replaced with *EN 16247-2 Energy audits - Part 2: Buildings*

Timeline for completing Large and Standard

- Second drafts issued;
- Second round of comments till November 6;.
- Final version issued by November 13th

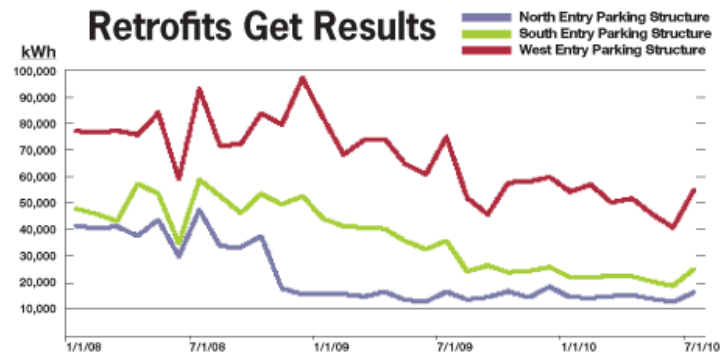


Targeted Tertiary and Targeted Apartment Blocks Protocols

For what?

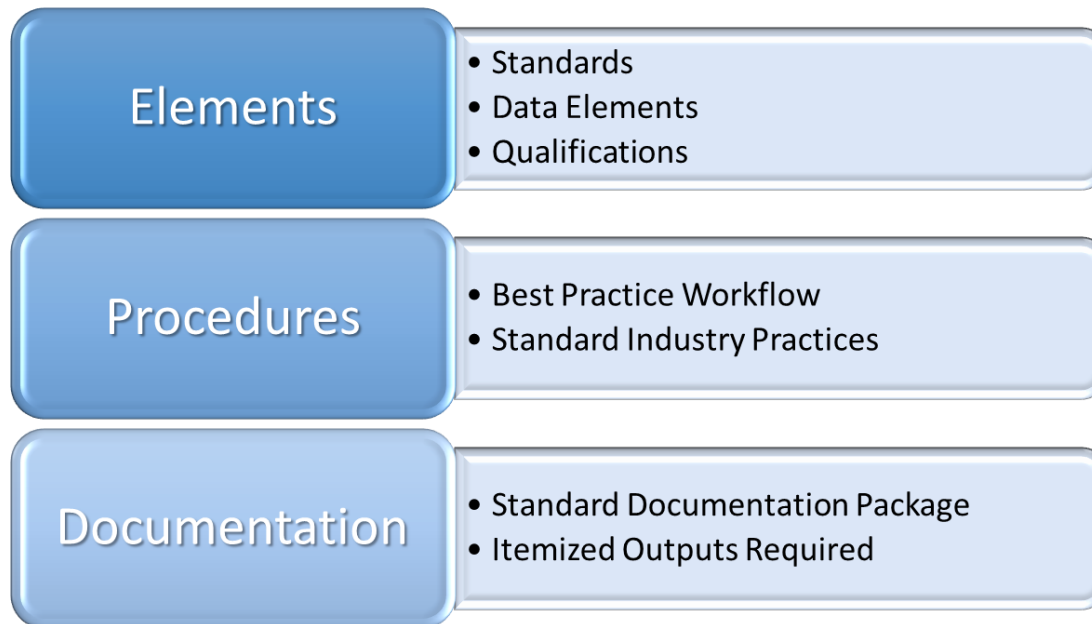
Corresponding to where the majority of the market opportunities reside:

- Tertiary or Apartment Blocks buildings;
- One or a limited set of ECM's;
- No or limited interactions between ECM's;
- No full energy audit of the building;
- Applicable to a building or set of buildings.



The University of California, Davis completed lighting retrofits in its three parking structures: the North Entry Parking Structure in late 2008 and the West and South Entry Parking Structures in late summer 2009. The graph illustrates the amount of kilowatt-hours (kWh) the structures generated before and after the retrofits.

Source: University of California, Davis Utilities



Baseline

- Specific to the proposed ECM's;
- Clear definition of boundary should be provided. Can be defined around a specific piece of equipment, a combination of equipment comprising a building subsystem, or a specific end-use;
- Baseline period should represent all operating conditions of a normal operating cycle for parameters relevant to ECM;
- Building asset data will be specific to the ECM's and systems involved in the project, not needing to include a comprehensive dataset for all building systems.

Savings projections

- Calculation with open-book spreadsheet methods or other non-energy modelling methods;
- ECM's descriptions: descriptions of the existing conditions, proposed retrofit, and potential interactive effects for each measure under consideration (limited under this protocols);
- Credentials: Savings calculation development and/or review by individual with professional engineering accreditation or five years minimum of demonstrated experience;
- Specific documentation requirements includes, for example: calculation tools used, basis for cost estimates, quality control statement indicating the findings of a review of calculation results against data from comparable projects.

Design, Construction and Verification

- Appointment of a qualified third party Operational Performance Verification Specialist as manager of the performance verification process is required;
- This Specialist must assure that the ECMs have been implemented as designed and can be expected to perform as conceived and projected during the energy savings calculation phase. This will include consultation with the project team, monitoring of designs, submittals and project changes, and inspections of the implemented changes. The Specialist must have the responsibility and means of reporting deviations from design and projected energy savings to the Project Owner in an issue log.

Design, Construction and Verification

- Development of an Operational Performance Verification plan (pre-construction) that describes the verification activities, target energy budgets and key performance indicators;
- Training of building operators in operation of the new systems/equipment, including their energy performance targets and key performance indicators;
- Concise documentation shall be provided that details activities completed as part of the operational performance verification process and significant findings from those activities, which is continuously updated during the course of a project.

Operations, maintenance and Monitoring

- Development of a concise, targeted Operator's Manual discussing the new ECMs or systems, including assignment of responsibilities for communication of performance issues and implementation of corrective actions;
- Training of building operators in proper maintenance best-practices for the new and modified systems/equipment;
- Documentation on operator's manual, maintenance plans and training curriculum.

Measurement & Verification

- All input data, baseline calculations, and variable derivations must be made available to all parties and any authorised reviewers;
- Reproducibility: given the same source data and a description of the adjustment methodology, any competent practitioner must be able to produce identical or nearly identical results.
- Measurement and Verification plan;
- Justification for the IPMVP option applied to the measures;
- Data collected and used in the analysis;

Warning...

- “Less demanding” implementation, but only effective on the right type of projects;
- Extremely important to make sure there are no or limited interactions between ECM’s;
- Implementation procedures demanding added critical analysis from PD and QA, as we don’t depart from a standardized full building/systems analysis.



Examples for discussion/commenting...

- Sampling measurements?
- Should these be “no interactions” protocols?
- What should be best practice to inform the process on system level pre-retrofit consumption?
- Others (hands-up)?



Rapid adoption of LED lighting over the next 20 years in the United States could save about **\$265 billion in energy costs** and replace the construction of 40 new power plants.

Source: US Department of Energy

Timeline for completing targetted

- First drafts issued;
- First round of comments till November 6;.
- Second drafts issued by November 13;
- Second round of comments till November 27th;
- Final versions issued by December 4

Under discussion/commenting...

[ICP EUROPE](#)[COUNTRIES](#)[ALLIES](#)[BLOG](#)[PROTOCOLS](#)[TECHNICAL FORUM](#)[NEWS](#)[N. AMERICA](#)

Draft Protocols

EPP: 1st DRAFT Targeted Tertiary Protocol - [Comments](#)

welcome until 6th November 2015

- This Protocol is designed for targeted tertiary projects that involve building retrofits with only one or a limited set of energy conservation measures, without major interaction between them.
- Download Word version of 1st DRAFT Targeted Tertiary Protocol for comment [here](#).

EPP: 2nd DRAFT Large Tertiary Protocol - [Comments](#)

welcome until 6th November 2015

- This Protocol is designed for large scale tertiary projects that involve whole building retrofits and multiple measures with interactive effects.
- Download Word version of 2nd DRAFT Large Tertiary Protocol for comment [here](#).

EPP: 1st DRAFT Targeted Apartment Blocks Protocol -

[Comments welcome until 6th November 2015](#)

- This Protocol is designed for targeted apartment block projects that involve building retrofits with only one or a limited set of energy conservation measures, without major interaction between them.
- Download Word version of 1st DRAFT Targeted Apartment Blocks Protocol for comment [here](#).

EPP: 2nd DRAFT Standard Tertiary Protocol - [Comments](#)

welcome until 6th November 2015

- This Protocol is designed for standard scale tertiary projects that involve whole building retrofits and multiple measures with interactive effects.
- Download Word version of 2nd DRAFT Standard Tertiary Protocol for comment [here](#).

<http://europe.eepperformance.org/protocols-under-development.html>

Annex A: Index of National Standards – Update on research

Cross protocol national resources reference document



ENERGY PERFORMANCE PROTOCOL

ANNEX A: INDEX OF NATIONAL STANDARDS

VERSION EU 0.1 – SEPTEMBER 2015



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649836. The sole responsibility for the content of this document lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EASME nor the European Commission are responsible for any use that may be made of the information contained therein.

National Resources – UK example

Excerpt from Annex A showing Protocol stage 2 national standards/resources

Protocol stage	Applicable protocols	Protocol component	European Reference Provision	Relevant European reference (where available)	National equivalent standard: tertiary	National equivalent standard: residential
2. Baseline – Core Requirements	All	Accurate total floor area	How to calculate total conditioned floor area (e.g. measured from inside, outside or middle of walls)	EN ISO 13790-2008 (Section 3.2.6)	CIBSE TM47: Operational Ratings and Display Energy Certificates	CIBSE TM47: Operational Ratings and Display Energy Certificates
		Occupancy data	Different occupancy (number of people) times/patterns, extended hours behaviour and internal loads. Also includes information such as previous energy audits, details on when the building was built and refurbished, set points and occupant behaviour.	EN 16247-2 Energy audits buildings - Part 2: Buildings (Section 5.3.2)	CIBSE TM47: Operational Ratings and Display Energy Certificates	CIBSE TM47: Operational Ratings and Display Energy Certificates
		Material specifications/inventories	Detailed checklist of information to collect during a survey (e.g. light fitting type, heating system type, controls information etc.), including by building type e.g. industrial, multi-family	EN 16247-2 Energy audits - Part 2: Buildings (Section 5.3.2 and Annex D)	CIBSE Guide F: Energy Efficiency in Buildings, Table 18.2	CIBSE Guide F: Energy Efficiency in Buildings, Table 18.2
		Data calendarisation	How periods are consolidated to the integer years/months periods applied. Determine average daily usage during each partial month covered, and summing the daily average usage over the number of days in the calendar month.	ISO 16346:2013 Energy Performance of Buildings – Assessment of Overall Energy Performance (section 8.2.2)	CIBSE TM47: Operational Ratings and Display Energy Certificates	CIBSE TM47: Operational Ratings and Display Energy Certificates
		Baseline regression model methodology	Explains the concept of normalisation (linear regression), and provides examples.	ISO 50006:2014 Energy Management Systems – Measuring Energy Performance Using Energy Baselines and Energy Performance Indicators methodology (Annex D)	CIBSE Guide F: Energy Efficiency in Buildings (Section 19)	CIBSE Guide F: Energy Efficiency in Buildings (Section 19)
		Accuracy (appropriate goodness of fit of energy data to independent variables)	Explains Uncertainty Analysis, including how to calculate CV (RMSE).	IPMVP vol12012 (Appendix B)	CIBSE Guide F: Energy Efficiency in Buildings (Section 19)	CIBSE Guide F: Energy Efficiency in Buildings (Section 19)
	Residential and targeted only	Baseline energy use characteristics of the equipment	Summarises how to estimate energy savings based on energy use characteristics i.e. load and hours-of-use, and the significant of whether components are constant or variable.	IPMVP vol12012 (section 4.7.1)	CIBSE TM22 - Energy Assessment and Reporting Methodology	CIBSE TM22 - Energy Assessment and Reporting Methodology
	All	Commercial benchmarking of energy end use	Database which can be filtered based on building type and country. Outputs total energy consumption data and energy end use data (heating, cooling, lighting and total) to give a reality check against estimates.	Buildings Performance Institute Europe's Data Hub for the Energy Performance of Buildings (see http://www.buildingsdata.eu/)	CIBSE TM46 - Energy Benchmarks	CIBSE TM46 - Energy Benchmarks

Annex A – Country status


- Questionnaires received to date provide 50% coverage of relevant countries;
- However questionnaires have varying degrees of completeness.

Country	Questionnaire status	Completion % estimate
Austria	Response received	50%
Belgium	Awaiting response	
Bulgaria	Response received	90%
Croatia	Awaiting response	
Cyprus	No contact	
Czech Republic	Response received	90%
Denmark	No response	
Estonia	No contact	
Finland	No response	
France	No contact	
Germany	Response received	70%
Greece	Response received	70%
Hungary	No response	
Ireland	Awaiting response	
Italy	Response received	60%
Latvia	No contact	
Lithuania	Response received	30%
Luxembourg	No contact	
Malta	Awaiting response	
Netherlands	Response received	100%
Norway	No response	
Poland	Response received	50%
Portugal	Response received	50%
Romania	Response received	100%
Slovakia	No contact	
Slovenia	No contact	
Spain	Response received	60%
Sweden	Response received	60%
Switzerland	Response received	100%
United Kingdom	Response received	100%

EUROPA NEEDS



YOU

JOIN UP AT FABLE3KINGMAKER.COM  FABLE III
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**Help Us Identify the
Right National
Standards**

**[europe.eepformance.
org/standards-research](http://europe.eepformance.org/standards-research)**

**[luiscastanheira@eep
formance.org](mailto:luiscastanheira@eepformance.org)**

Project Development Specifications – Outline for the “One Stop Shop” for ICP Europe Application

What?

- The “One Stop Shop” for ICP Europe implementation!
- This document will provide enough information to allow PD and QA to apply the ICP system;
- To be used together with all other ICP Europe products – protocols, index of national resources and software packages.

INSULATION SAVINGS CALCULATOR

Enter Values Below

Area to be upgraded	1000	Square Feet	Enter the surface area of the space where insulation is to be upgraded.
Heating Degree Days	5000	HDD (Fahrenheit)	Help on finding Heating Degree Days for your area
Current R Value	10	US R Value	Help on looking up R values
New Total R Value	20	US R Value	Help on looking up R values

Pick your fuel type below – Then, correct fuel cost and furnace efficiency if desired

<input checked="" type="radio"/> Natural Gas			
<input type="radio"/> Fuel Oil	1.50	\$'s Per Therm	80 %
<input type="radio"/> Propane			
<input type="radio"/> Electricity			

Calculate Click Calculate button to update fuel saving

\$ Saving per year	0	Dollars	The dollar saving in fuel cost for the first year.
\$ Saving for 10 years	0	Dollars	The dollar saving in fuel costs for the first 10 years, assuming a 10% increase in fuel cost each year.
Greenhouse Gas Reduction	0	lbs per year	If electricity is the fuel, it is assumed it is generated in a coal fired power plant.

On structure...

- Guidance on protocol application – what protocol is best for my project?
- Critical path methodologies and resources
- Templates for plans and other supporting elements
- Glossary

Investor Confidence Project

A framework for energy efficiency project development that provides consistent standards, documentation and verification:

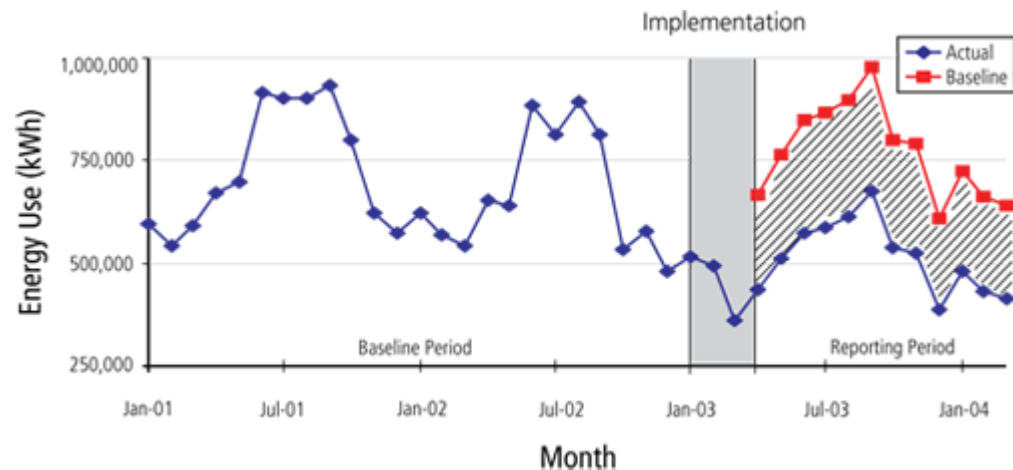
- Reduces transaction costs
- Improves project performance
- Produces better data

Project Development Specifications cover:

- Establishing project baselines
- Calculating energy savings
- Verifying operational performance
- Training
- Project documentation
- Operations, maintenance, and monitoring
- Measurement and verification

When?

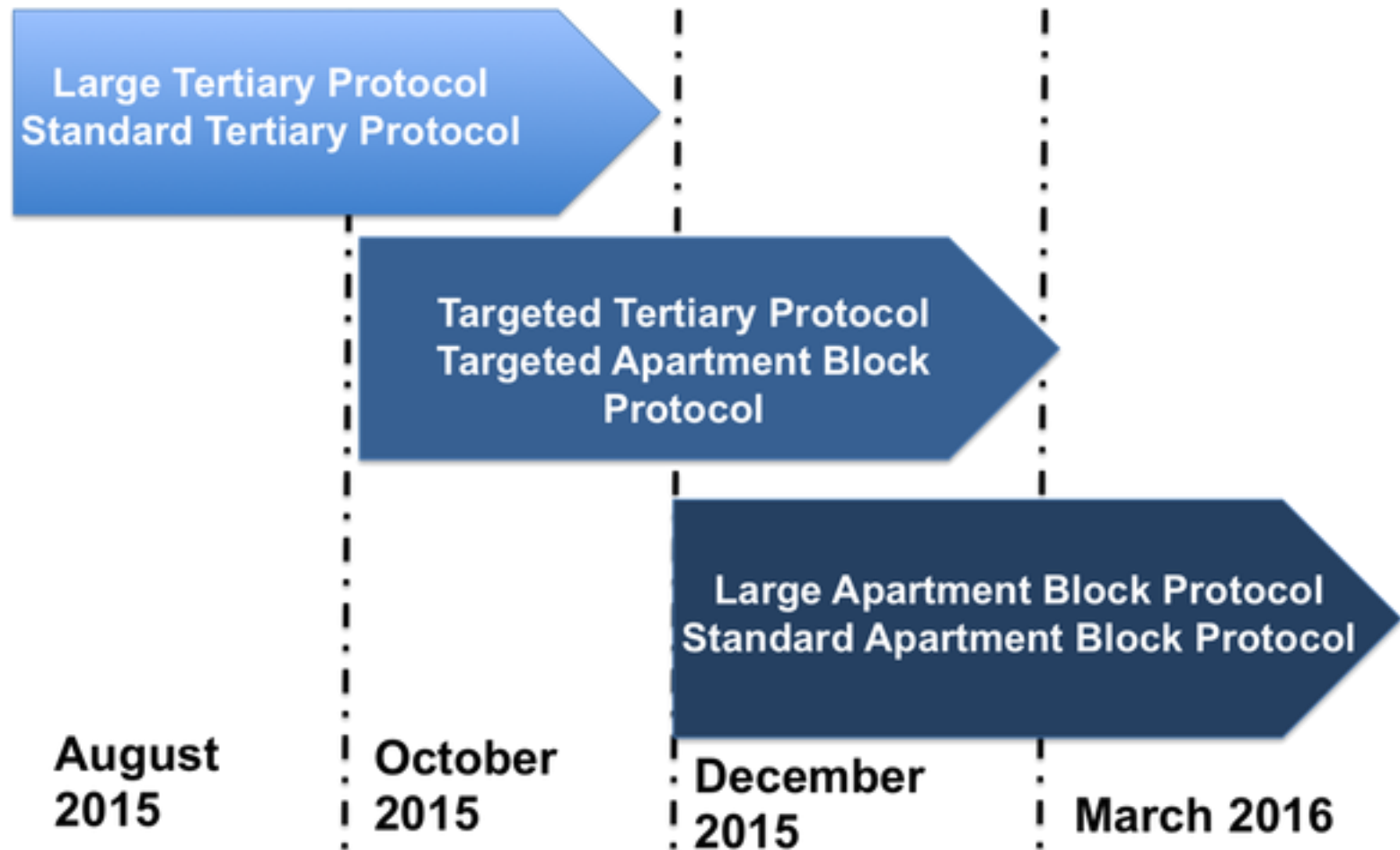
- First draft January 2016
- Commenting period January-February 2016
- Final issuing before March 2016



Timeline and next steps



ICP Europe Protocol Timeline – 2015-16



How can you help:

- Tell us if these drafts fully respond to the needs and specificities of your markets – please comment;

<http://europe.eepformance.org/protocols-under-development.html>

- Deploying application on your projects – we are here to support you;
- Help us reaching experts to identify best practices;

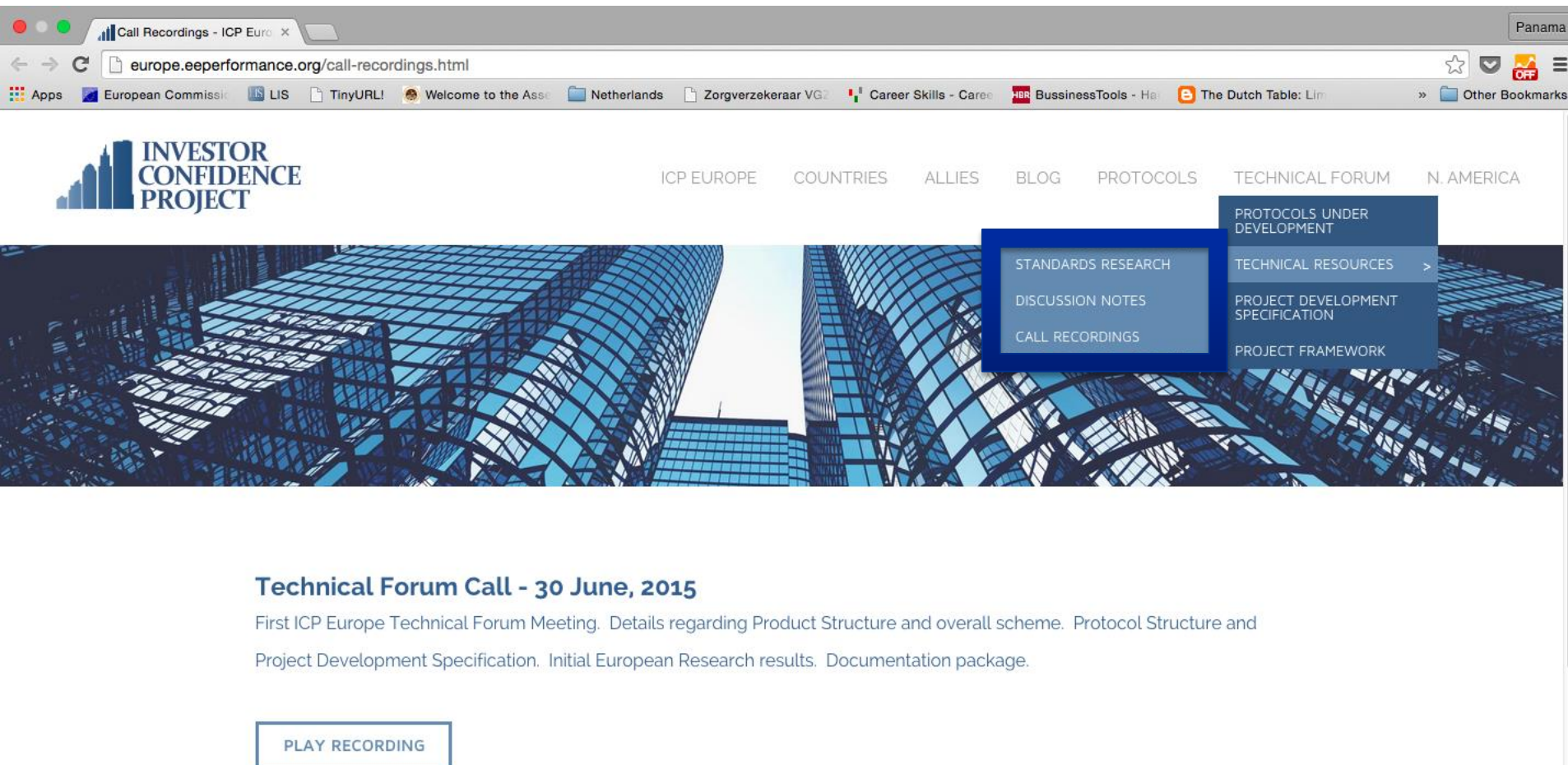
<http://europe.eepformance.org/standards-research.html>

- Get in touch with us on a one to one basis, through myself if you would like to address any particular issue or just to discuss ;

luis.castanheira@eepformance.org

Technical Forum Resources Webpage

europa.eepperformance.org/technical-resources



Call Recordings - ICP Euro x

europa.eepperformance.org/call-recordings.html

Apps European Commission LIS TinyURL! Welcome to the Ass Netherlands Zorgverzekeraar VG Career Skills - Caree BusinessTools - Har The Dutch Table: Lim Other Bookmarks

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PROJECT

ICP EUROPE COUNTRIES ALLIES BLOG PROTOCOLS TECHNICAL FORUM N. AMERICA

PROTOCOLS UNDER DEVELOPMENT
TECHNICAL RESOURCES
PROJECT DEVELOPMENT SPECIFICATION
PROJECT FRAMEWORK

STANDARDS RESEARCH
DISCUSSION NOTES
CALL RECORDINGS

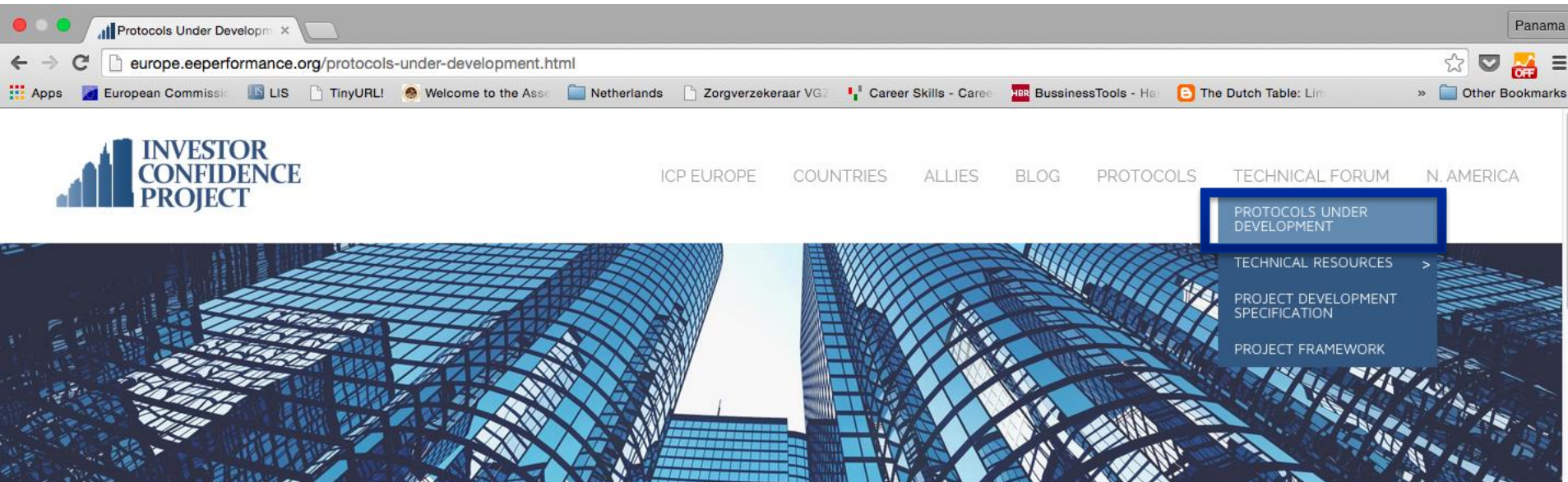
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PLAY RECORDING

Protocols Under Development Webpage

europa.eepperformance.org/protocols-under-development



Protocols Under Development

Below you will find the Investor Confidence Project Europe **Energy Performance Protocols** that are currently under development. The development process involves research and drafting by the ICP Europe staff, a series of review of drafts and comments by the ICP Europe **Technical Forum** and then a release to the market place with training on the use of the protocols.

The **Technical Forum** is a free to join group of industry experts drawn from finance, engineering, government, academia and other sectors interested in the financing of building energy renovations. The **Technical Forum** meets once a month via webinar for 1.5 hours to review protocols and offer feedback. If you would like to join the Technical Forum please feel free to do so at this [link](#).

ICP Europe Ally Network Members

EMVC Solutions

CLIMATE STRATEGY PARTNERS



Association for the Conservation of Energy

Green Investors



EUROPE REGIONAL NETWORK



If you are not here you should be.

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Verco

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Green Investment Bank

GEOCAPITA

axia partners



RdA CLIMATE SOLUTIONS

EcoProsperity Capital Ltd

lavery/pennell

zesco Zimmermann Energy Services



CO2 Estates Maximising Real Estate Performance

PORTO VIVO Social Code for Real Estate

EnergyPro

sefaira



SMARTWATT Solutions for Energy Systems

IMPIANTI TECNOLOGICI COGENERAZIONE GESTIONE CALORE ENERGIE RINNOVABILI

ives | Independent Verifiers of Energy Efficiency Savings

The CARBON & ENERGY FUND

enerak securing your energy future

Servizi Energia Ambiente S.R.L.

RENEESCO

eeVs Energy Efficiency Verification Services

mpw

ADAPT

Klimaschutz- und Energieagentur Baden-Württemberg GmbH



KEA

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masterplan



sustainable value for real estate

ift surveys

INVESTOR CONFIDENCE PROJECT

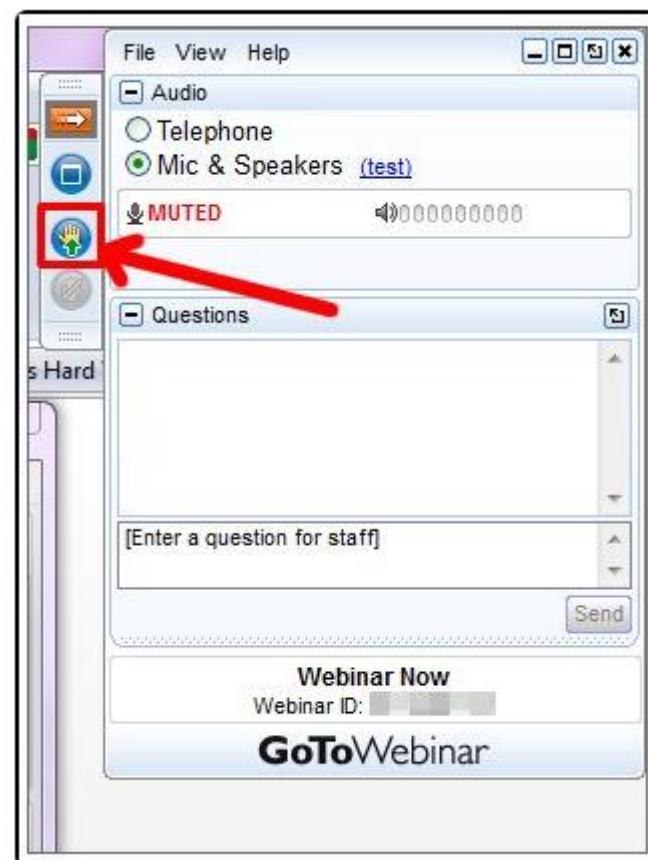
British Energy Efficiency Federation

isgreen INTELLIGENT LIGHT FOR BUILDINGS

**THANK YOU ALL FOR YOUR TIME
AND
WELCOME TO ICP EUROPE TECHNICAL
FORUM**

Do You Have Questions?

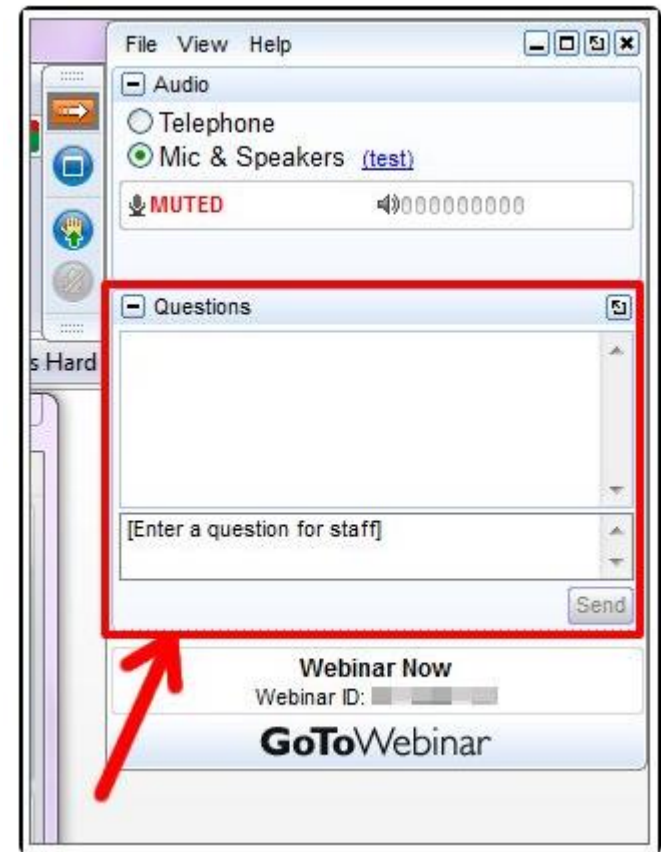
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www.EEperformance.org

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