



Efficiency
Valuation
Organization

THE INTERNATIONAL ENERGY EFFICIENCY FINANCING PROTOCOL (IEEFP)

Denis Tanguay

Executive Director

Efficiency Valuation Organization

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GLOBAL ESCO NETWORK

EFFICIENCY VALUATION ORGANIZATION

evo-world.org



The home of the **IPMVP**®



A 22-year-old **non-profit** corporation



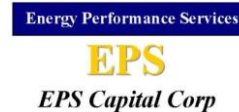
Led by **volunteers** around the world

VISION

Create a world that has confidence in energy efficiency as a reliable and sustainable energy resource.

MISSION

Ensure that the savings and impact of energy efficiency and sustainability projects are determined through appropriate measurement and verification.



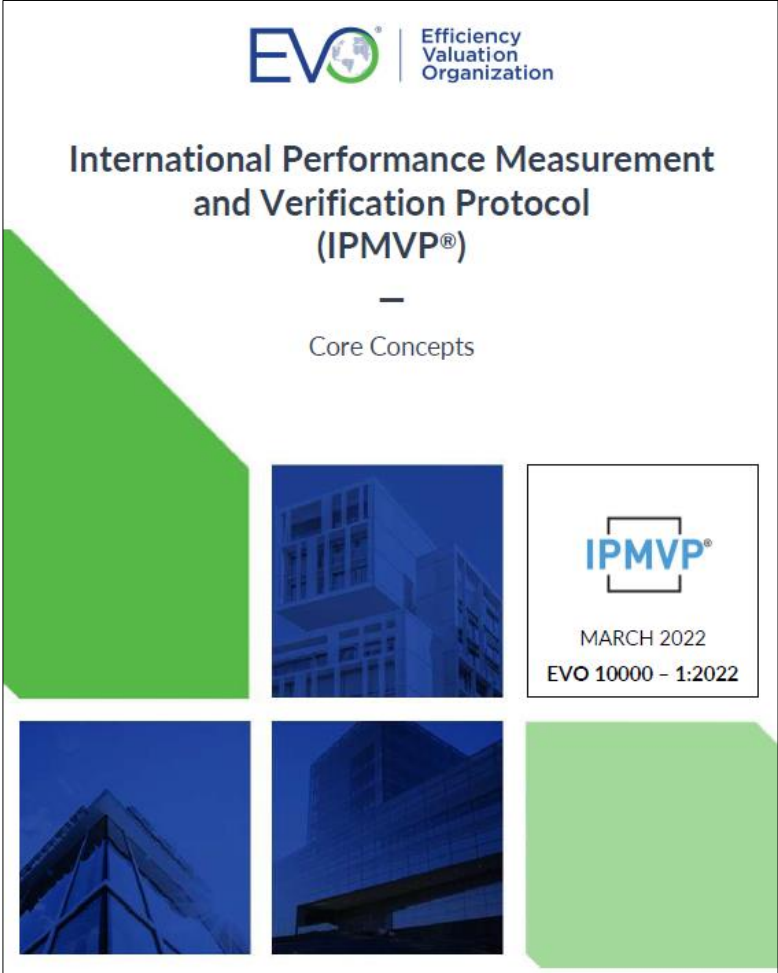
International Performance Measurement and Verification Protocol (IPMVP®)

1996
North American
Energy
Measurement and
Verification Protocol
(NEMVP)

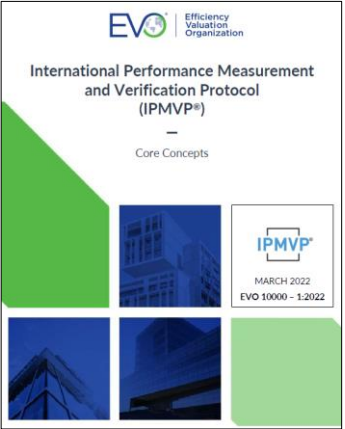
1997
International
Performance
Measurement and
Verification Protocol
(IPMVP)



- IPMVP 2002
- IPMVP 2004
- IPMVP 2007
- IPMVP 2009
- IPMVP 2012
- IPMVP 2014
- IPMVP 2016
- IPMVP 2022



Product portfolio – Status and future work



IPMVP CORE CONCEPTS 2022 IN ITALIAN AND SPANISH (MEXICO)

M&V FOR PERFORMANCE CONTRACTING

ADVANCED M&V

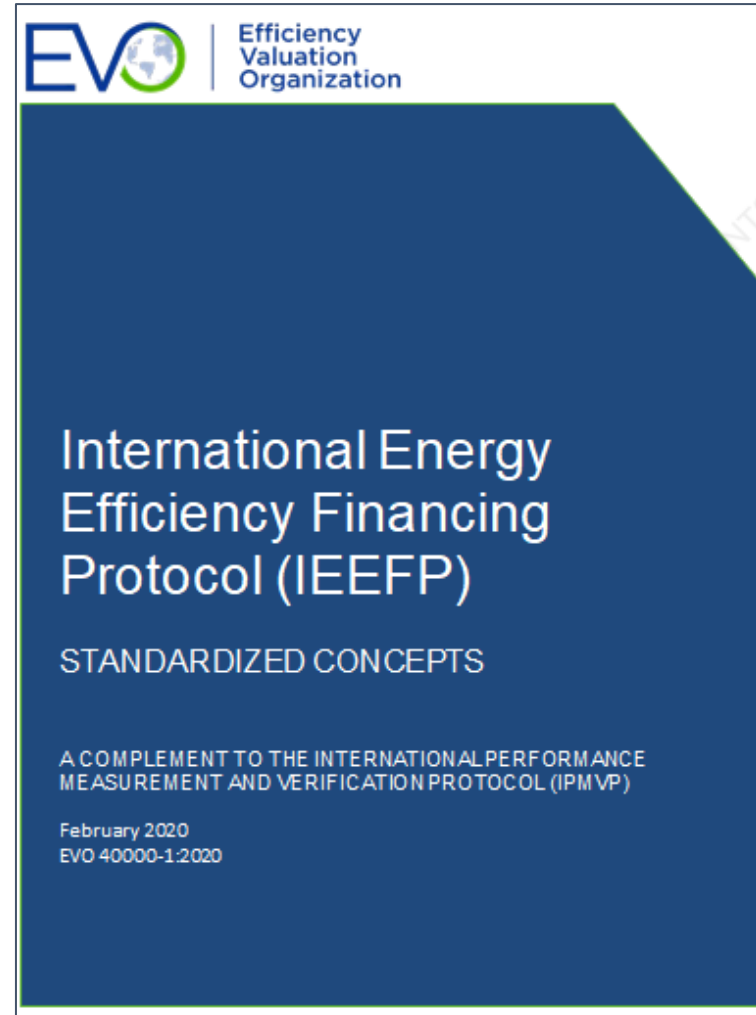
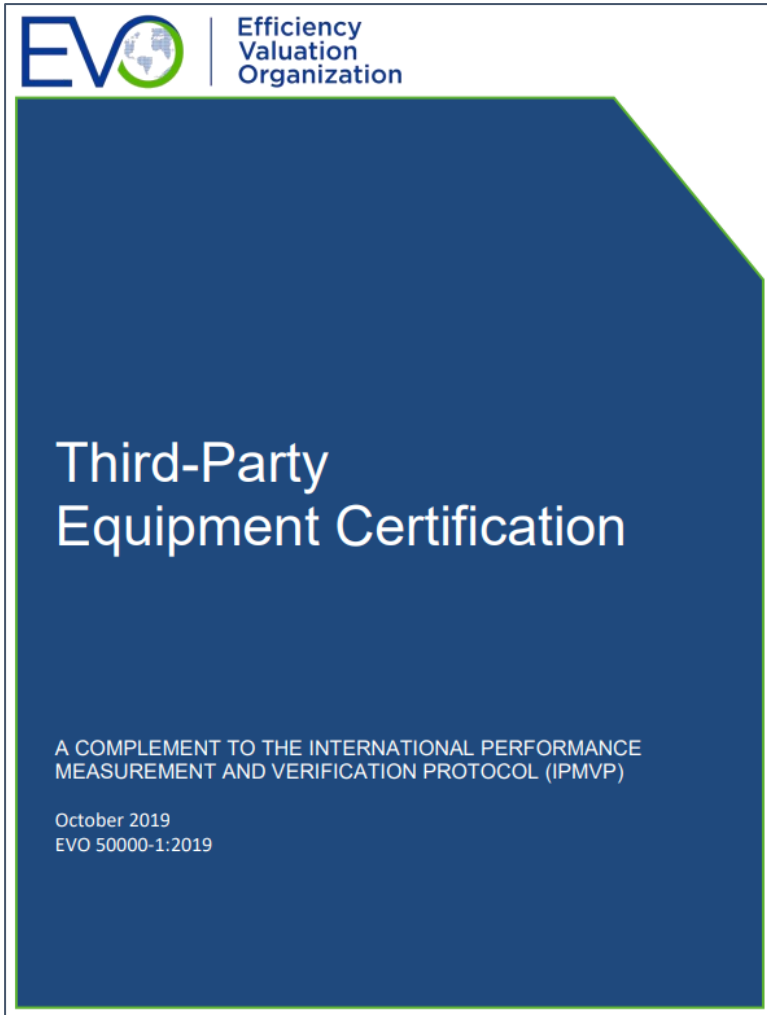
EVALUATION, MEASUREMENT & VERIFICATION

UNCERTAINTY ASSESSMENT GUIDE

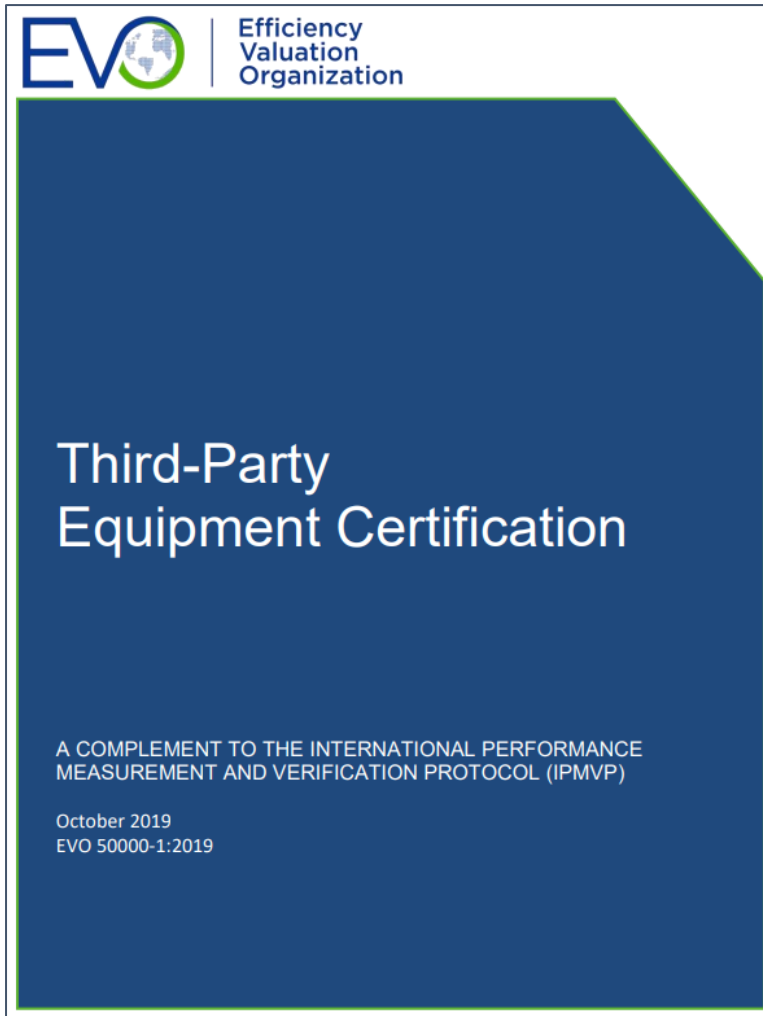
- M&V FOR WATER**
- M&V FOR RENEWABLES**
- M&V AND OPTION D**



Product portfolio – Complements to the IPMVP



Third-Party Equipment Certification



This document aims to enhance the importance and added value of third-party certification of equipment performance for site-specific M&V Plans and to describe the best practices of existing third-party certification programs.

The document presents:

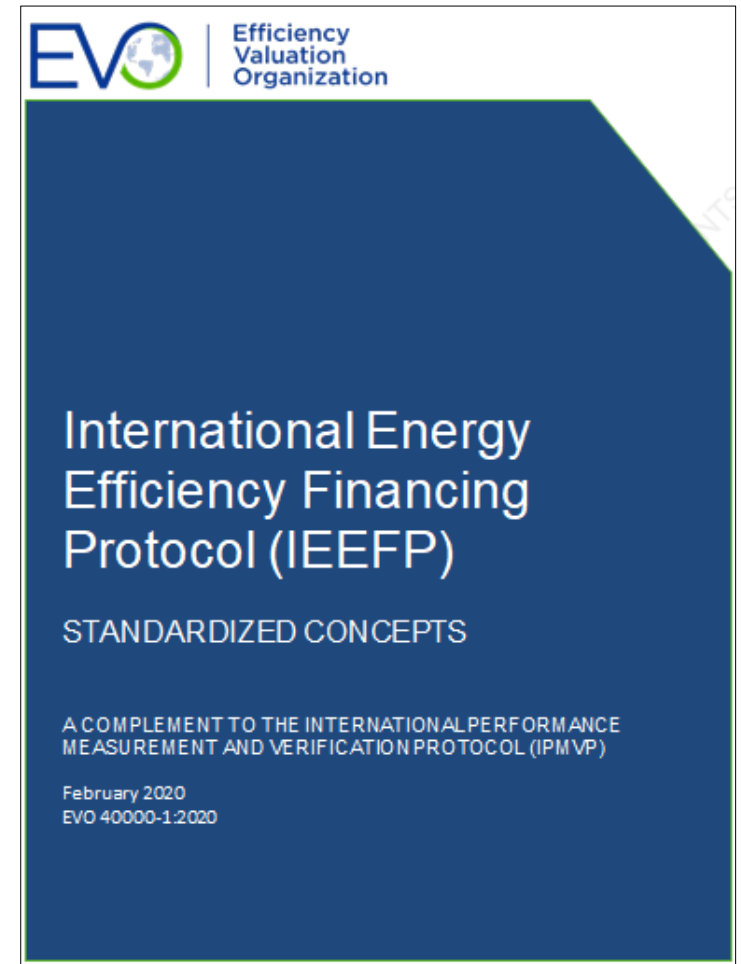
- (1) Rationale for conducting and using third-party equipment-performance certification.
- (2) Some evaluation methods, including testing and verification and best practices applicable to specific equipment categories.

The document provides:

- Risk reduction tool
- An understanding of products' performance expectations
- Guidance for operational verification
- Etc.

International Energy Efficiency Financing Protocol (IEEFP)

- Blueprint that provides concepts and guidelines to facilitate an understanding by loan, risk, and credit officers of **the key elements** needed to evaluate and provide **attractive energy efficiency project loans** to facility owners, ESCOs, and other potential developers and implementers of energy efficiency Projects.
- The IEEFP is complemented by specific country annexes covering local regulations affecting energy efficiency project financing.
- Hands-on training on applying specific tools, project-based templates, and materials provided in the program.

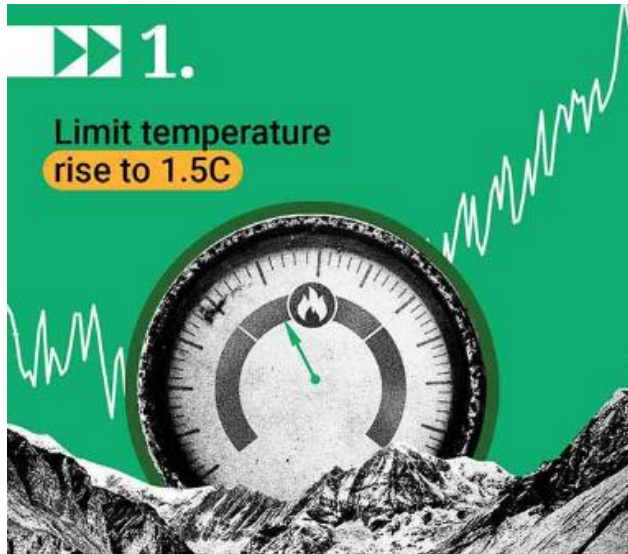


Why bother about energy efficiency?



Why bother about energy efficiency?

PARIS AGREEMENT – 2015



Its overarching goal is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts **“to limit the temperature increase to 1.5°C above pre-industrial levels.”**

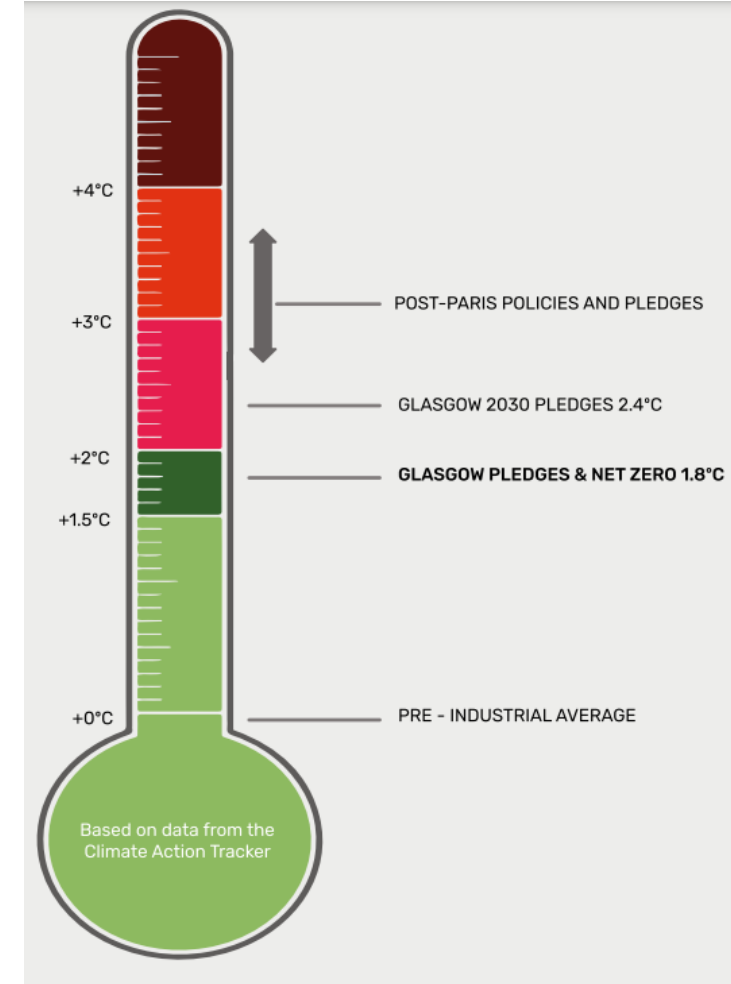
COP 26 – 2021 (GLASGOW)

GLASGOW HAS KEPT 1.5°C IN REACH BUT FURTHER ACTION NEEDED

Ahead of Paris, some scientists said that there was a chance that temperatures could ultimately rise by up to 6°C. The pledges made under the Paris Agreement had the world on track to a 2.7-3.7°C rise.

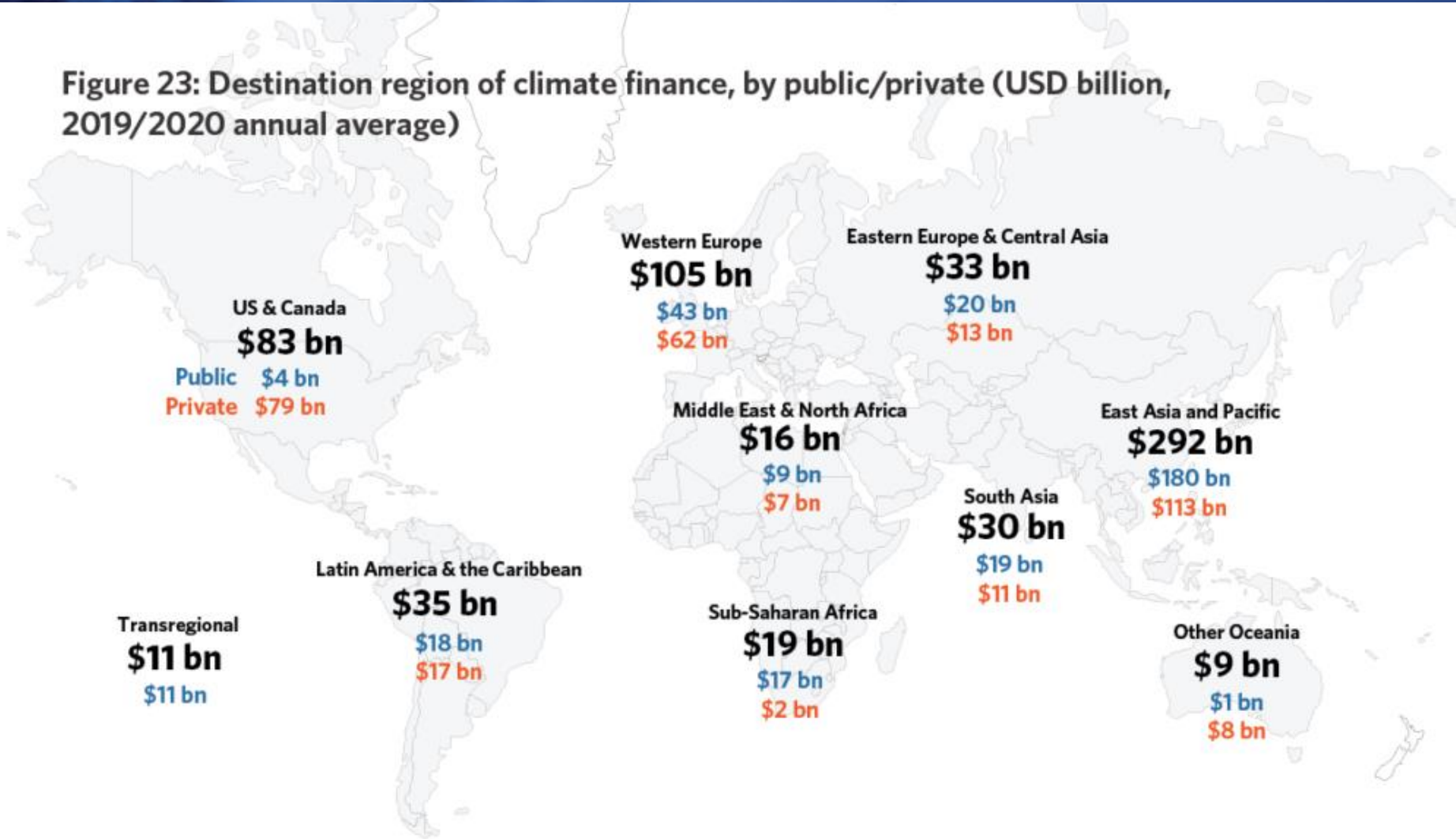
If the pledges made at Glasgow are fully implemented, warming will be kept below 2°C; and with the commitment to further action over the next decade we have kept 1.5°C in reach.

The Glasgow Climate Pact only keeps 1.5C in sight if countries take concerted and immediate action to deliver on their commitments. This means **phasing down coal power, halting and reversing deforestation, speeding up the switch to electric vehicles and reducing methane emissions.**



Energy efficiency financing market opportunities

Figure 23: Destination region of climate finance, by public/private (USD billion, 2019/2020 annual average)



2019/2020

\$633 bn
Public = \$322bn
Private = \$311bn

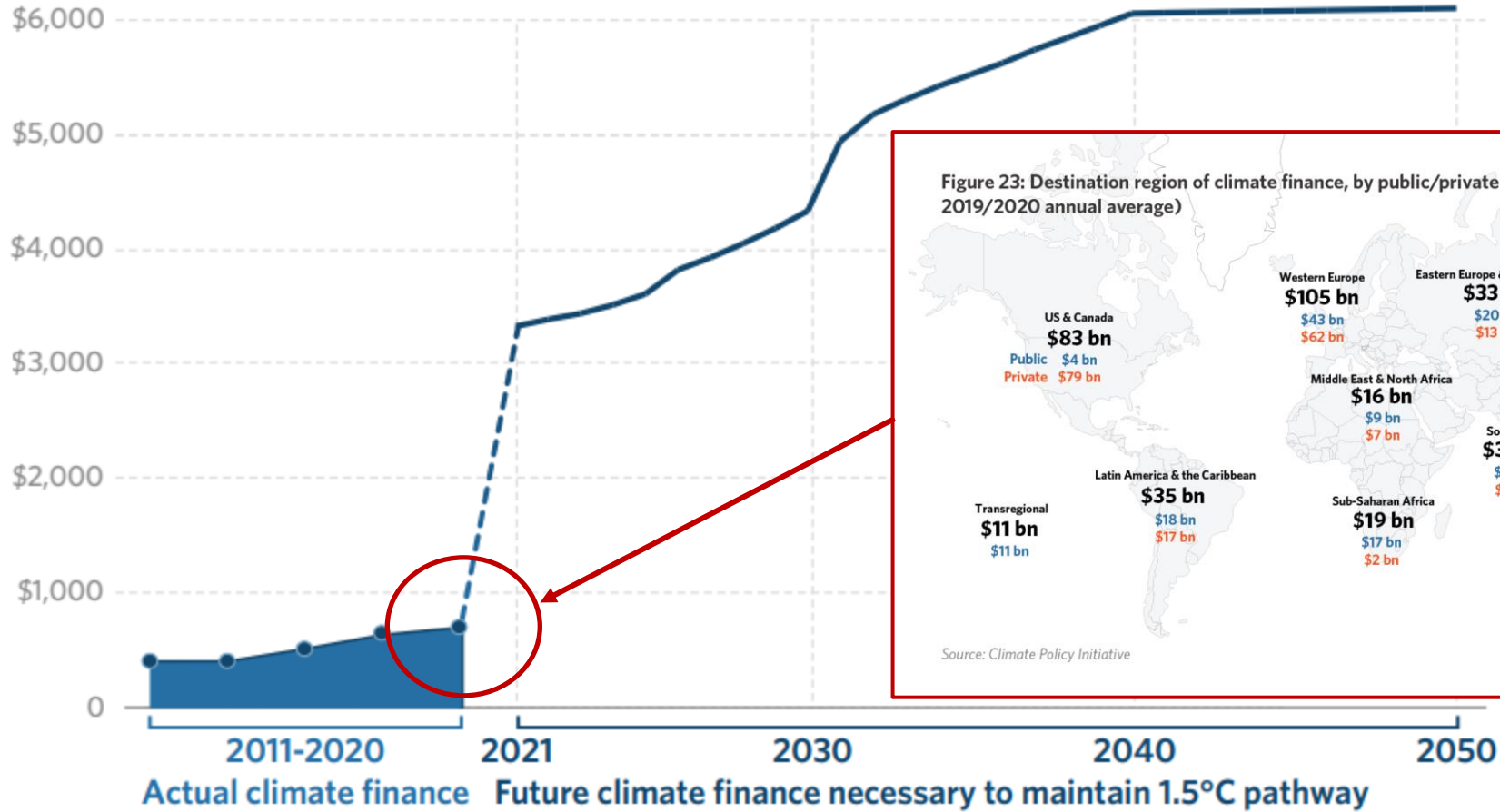
Source: Climate Policy Initiative

<https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2021/>

Energy efficiency financing market opportunities

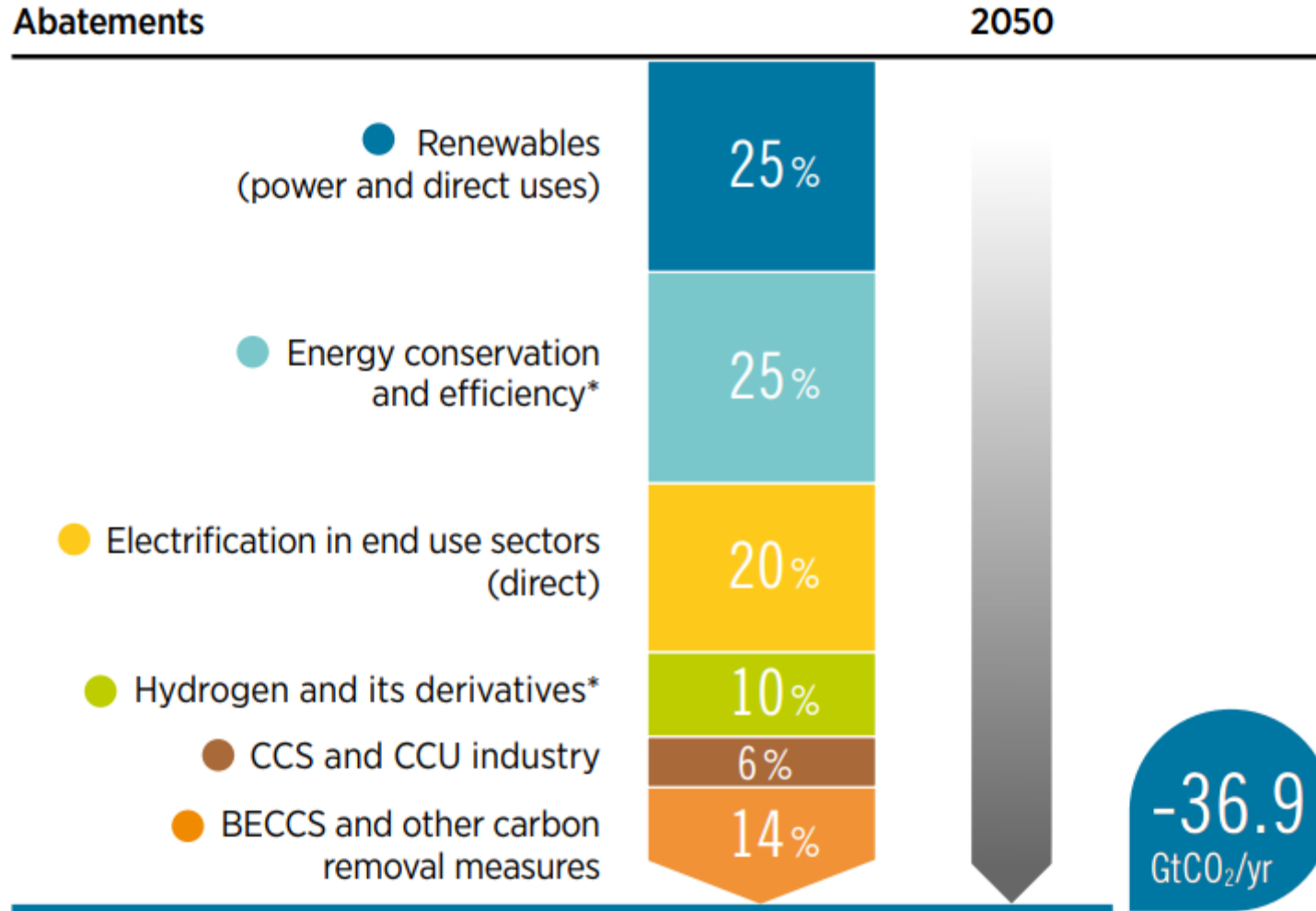
Global tracked climate finance flows and the average estimated annual climate investment need through 2050

(USD billion)



Energy efficiency financing market opportunities

Carbon emissions abatements under the 1.5°C Scenario (%)



Why now?



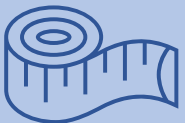
Tightening of global energy supply

- Concerns about security of supply, price volatility, supply chain disruptions
- Triggers deep concerns about short term energy savings but also for longer term energy efficiency measures and projects



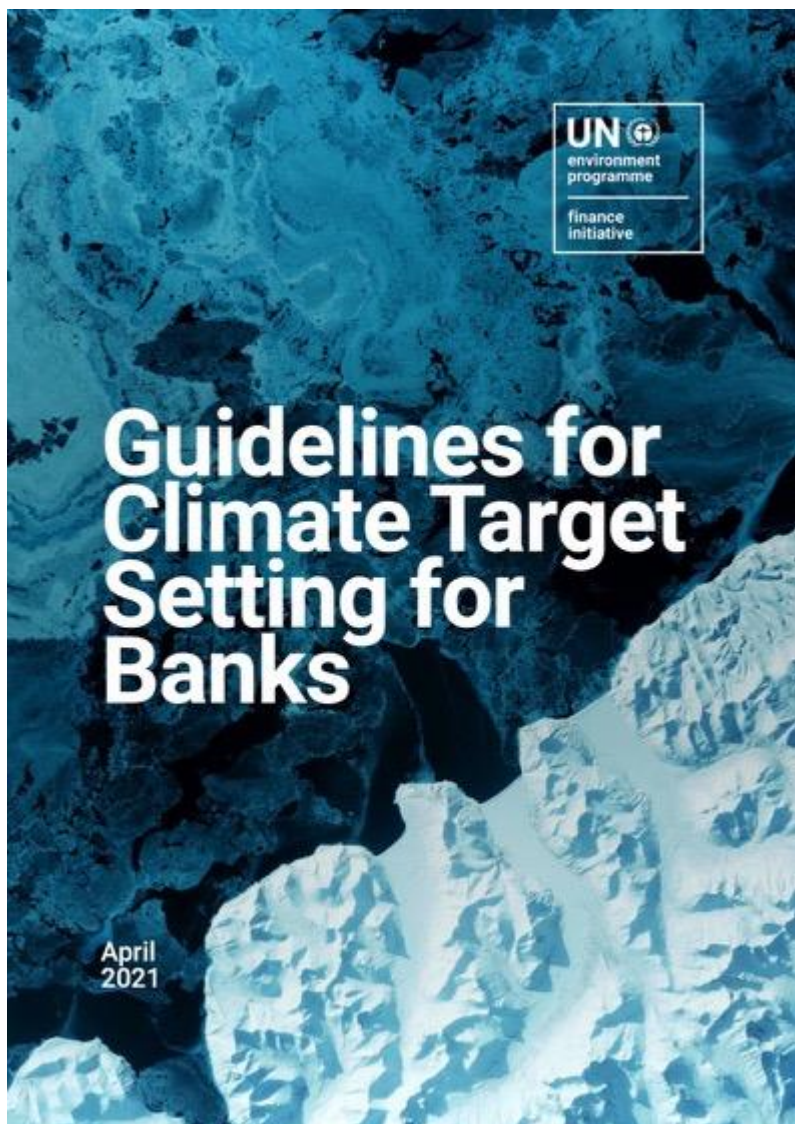
Decarbonization is driving renewed interest for energy efficiency

- Regulatory response with strict obligations to reduce energy consumption and demand
- Financial institutions are joining the efforts with initiatives such as the Partnership for Carbon Accounting Financials (PCAF) – development of GHG accounting methodologies for financed emissions



Increasing interest for measured and demonstrated savings

- Project funders require “hard” evidence that savings are real
- Everyone is looking for risk reduction methodologies



One

Banks shall set and publicly disclose long-term and intermediate targets to support meeting the temperature goals of the Paris Agreement.

Two

Banks shall establish an emissions baseline and annually measure and report the emissions profile of their lending portfolios and investment activities.

Three

Banks shall use widely accepted science-based decarbonisation scenarios to set both long-term and intermediate targets that are aligned with the temperature goals of the Paris Agreement.

Four

Banks shall regularly review targets to ensure consistency with current climate science.

Financial institutions response



2022 SAMPLE WEBINARS

Decarbonization through energy efficiency towards the achievement of net-zero targets

by Livia Miethke Morais

 Presentation material

 Recording



Driving investment in climate solutions

<https://evo-world.org/en/news-media/m-v-week-2023>

Long-standing global energy efficiency barriers

Lack of capacity among project developers

Real or perceived high initial investment costs

Lack of trust in solution performance

Imperfect information

Lack of awareness of beneficiaries about efficient technologies

Hidden costs and perceived higher risks

Lack of financing options

Asymmetric information

Absence of qualified energy efficiency technology and service providers

Promised returns uncertain or not credible

Inertia or resistance to change

Stakeholders unable to interpret the information

“Energy efficiency is not our core business”

Lack of capacity to maintain the assets

Decision-making routine

Lack of trust in information sources

Long-standing global energy efficiency barriers

EE projects are **SMALL, COMPLEX, and 'BORING'**

The apathy of facility owners

No 'attractive' energy efficiency financing

- The Problem is NOT a lack of available funds!
- Available funds cannot be accessed from the most cost-effective local sources (**Banks**) on commercially attractive terms
- Caused by 'DISCONNECT' in current lending practices of banks versus needs of facility owners, ESCOs, and other developers in their funding EE Projects

- In many companies, EE Projects are viewed as Infrastructure investments (don't fix unless broken)
- EE Projects cannot compete with internal capital for core business investment hurdle rates (1-2 years)
- Benefits of EE projects too small to get on CEO's radar screen or justify inherent complexities and perceived potential operating risks
- Available EE financing reduces core business funding capacity
- Little confidence in savings being realized or measured
- Added complexity for commercial building owners where utilities are paid by tenants

What is bank disconnect?

Banks provide traditional corporate asset-based lending limited to ~70% of energy efficiency project capital cost, requiring :

- ✓ 30% equity investment in the energy efficiency projects and
- ✓ 100% collateral or guarantees on loan amount – *and the only collateral value of EE projects is the savings.*

Banks do not have confidence in savings of energy efficiency projects, thus no increased credit capacity to facility owners

Limited interest in energy efficiency projects due to small transactions, complexities and inability to evaluate the risks and the benefits

Typically offer short-term loans from existing line of credit or fully collateralized with additional assets

Challenges for banks to provide attractive EE project finance

Challenges that **CANNOT** be addressed at the level of the bank

- Higher provisions requirements for project finance
- Regulations for risk categorization of equipment as collateral by the central bank.
- Regulatory

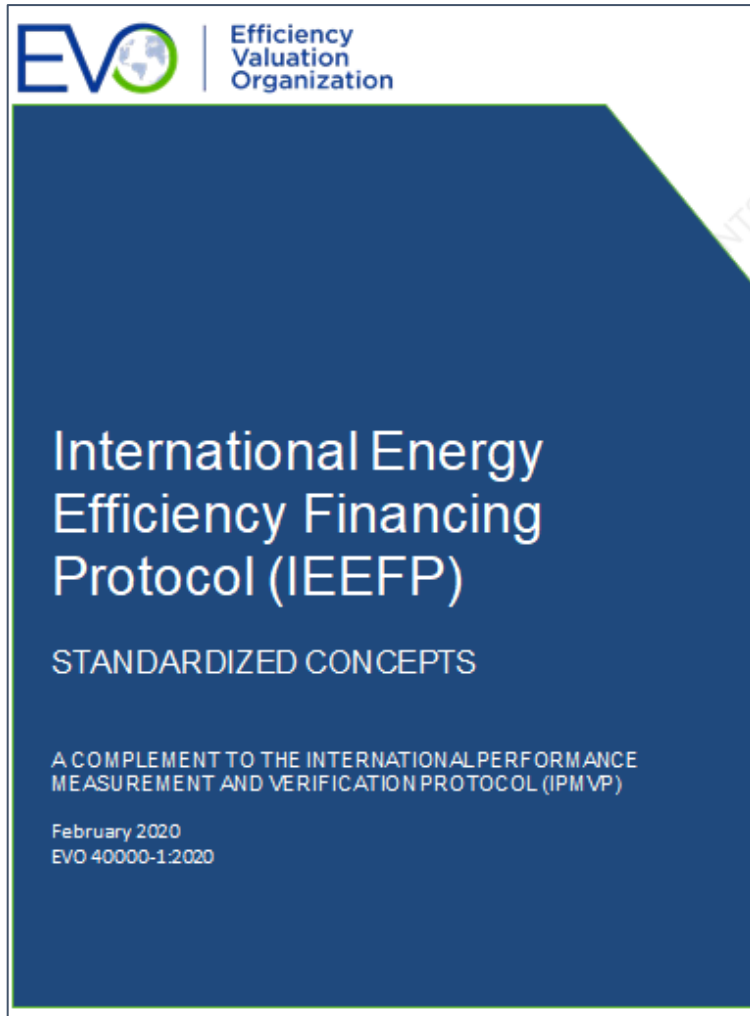


Challenges for banks to provide attractive EE project finance

Challenges that CAN be addressed at the level of the bank

- Limited energy efficiency knowledge and capacity
- Projects are not appealing (small and complex)
- Projects are not “business as usual” (Project-based)
- Insufficient collateral
- No confidence in future cash flow
- Insufficient loan applications and investment grade audits due to lack of energy efficiency project development capacity by local consultants, ESCOs, etc.

International Energy Efficiency Financing Protocol (IEEFP)



The main objective of IEEFP is to create an understanding for **local financial institutions** of how energy efficiency (EE) projects generate reliable cost reductions (savings) in a facility's existing operating expenses.

To accomplish this, IEEFP is designed to enhance the credit officer's knowledge of the following:

- How EE Project savings can be relied upon for loan repayment & increased the facility owner credit capacity;
- How to evaluate and mitigate risks of EE projects delivering estimated savings (ignoring any attempt to educate them on how to evaluate borrower credit risk since they should already possess this core competency);
- How to structure a project-based loan that minimizes risk and provides an attractive internal rate of return (IRR);
- How the measurement and verification (M&V) of energy savings can be reliably performed is critical to documenting and ensuring sustainable EE savings.

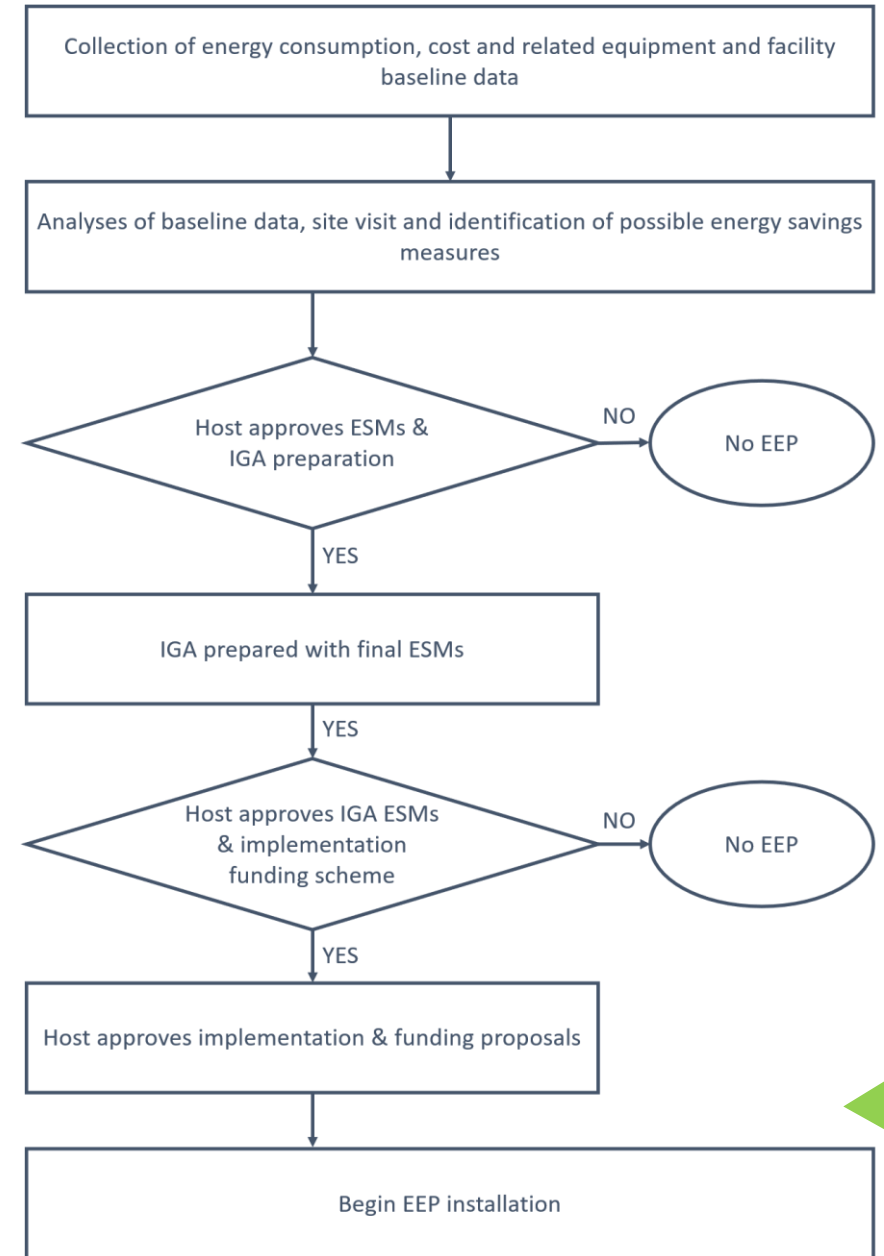
Chapter 3 – Energy Efficiency Technologies

- This chapter provides insights regarding key aspects and savings risks of the major proven EE technologies typically implemented in retrofit EEPs within buildings and industrial facilities.
- The major technologies discussed here are:
 - High-efficiency lighting systems
 - Boilers
 - Heating, ventilation, and air conditioning (HVAC) systems
 - Variable speed drives (VSD)
 - Building automation systems (BAS)
 - Heat recovery systems
 - Building shell and fenestration
 - Motors
 - Chillers

Technology	Key Aspects	Useful Life	Simple Payback	M&V Factor	Savings Risks
High-efficiency Lighting	<ul style="list-style-type: none"> ▪ Typically represents the most cost-effective EE improvement in buildings. ▪ LED lamp technology provides better quality lighting for significantly less electricity and can eliminate 2-3 lifetime lamp replacements. ▪ LEDs provide a significant savings opportunity for municipal street lighting. ▪ Natural daylighting and controls can also reduce electricity consumption and improve visual comfort. 	50,000 to 100,000 hours (10-15 years)	2-3 years	Easy to isolate and measure the savings impact.	Low

Chapter 4 – Energy Efficiency Project Development and Finance Process

- Chapter four proposes a brief overview of the typical process followed by facility owners (as prospective hosts), ESCOs, and project developers in their development and financing of an energy efficiency project.
- The processes most critical to the successful development of any EEP are a properly-prepared IGA and an IPMVP-adherent M&V plan



Chapter 5 – Investment Grade Audit

- Chapter 5 discusses the requirement for a properly prepared investment-grade audit (IGA) as a critical step for an energy efficiency project to be successfully implemented.
- It briefly describes the content of a typical IGA with a focus on describing the recommended energy efficiency measures, the baseline of the energy use, the implementation schedule, and the financial analysis.
- It gives additional insights into industrial process facilities.
- It also outlines some significant shortcomings commonly found in an IGA.

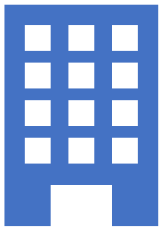
Chapter 6 – Measurement and Verification (M&V)

- Chapter 6 explains how M&V is the meter of an energy efficiency project and thus is critical to documenting the achieved savings and the resulting internal rate or return of an energy efficiency project investment.
- It explains the four IPMVP options and provides insights on selecting an option.
- It discusses the role and importance of developing a clear and transparent project-specific M&V Plan that describes various measurements and data to be gathered, analysis methods employed, and verification activities conducted to evaluate the performance of an energy efficiency measure.



Chapter 7 – Key Stakeholders

- Chapter 7 emphasizes the role of various stakeholders involved in implementing an energy efficiency project.
- In a detailed table format, it provides details on the types of stakeholders in each category, their role in a project, the benefits they get or provide in a project, and the concerns that each of the stakeholders faces in a project.



**END USERS
(HOST)**



**PROJECT
DEVELOPERS**



FUNDERS



NOT-FOR-PROFITS



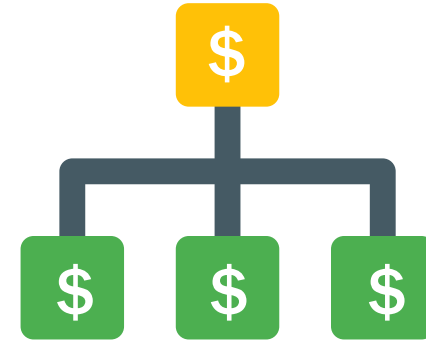
**PRODUCT & SERVICE
PROVIDERS**



**ENERGY
SUPPLIERS**

Chapter 8 – Energy Efficiency Project Financing Options

- Chapter 8 reviews the primary financing options available to facility owners to finance their projects:
 - Host equity
 - Loans
 - Leases
 - Installment purchase contingent payment contract
 - Infrastructure as a service
 - Energy services contracts (ESCO)



Chapter 9 – Energy Efficiency Project Contracts

- Chapter 9 reviews the most common contracts facility owners use to develop, finance, implement, and operate an energy efficiency project.
 - Consulting fee-based agreements with consultants
 - Construction and maintenance fee-based agreements
 - Financing agreements
 - Energy savings performance contracts (ESPC) with ESCOs for savings-based structures
 - Agreements when energy efficiency projects are financed / owned by special purpose entities (SPEs).

Chapter 10 – Energy Efficiency Financing Market Needs

- Chapter 10 explains how energy efficiency project financing need to be provided on a project versus corporate basis to be attractive to facility owners, ESCOs, and other project developers.
- It puts the emphasis on six key features of such financing:
 1. no additional collateral is required beyond the EEP assets installed and future cash flow from EEPs;
 2. provided in local currency and as additional financing with no impact on existing credit capacity;
 3. include the financing of construction CAPEX and interest during construction;
 4. repayment term significantly longer than EEP's simple payback period;
 5. interest and financing costs equal to or below best available market rates; and,
 6. readily available to Hosts, ESCOs, and other project developers.
- The protocol provides a sample energy efficiency project loan structure and proposes two examples of cash flows based of different levels of debt financing (70 % and 100%)



Chapter 11 – Energy Efficiency Project Financing Risks and Mitigation Strategies

- Chapter 11 presents a detailed discussion of projects' performance risks and mitigation strategies at different levels:
 - Development
 - Implementation
 - Operation
 - Contractual
- The document then provides an extended discussion on performance-based ESCO models. In the perspective of educating loan officers, it explains the mechanics of shared savings, the payment structure, the scope of work, the typical terms and conditions, and each party's responsibilities.



Chapter 12 – Guarantee Mechanisms for Financial Institutions

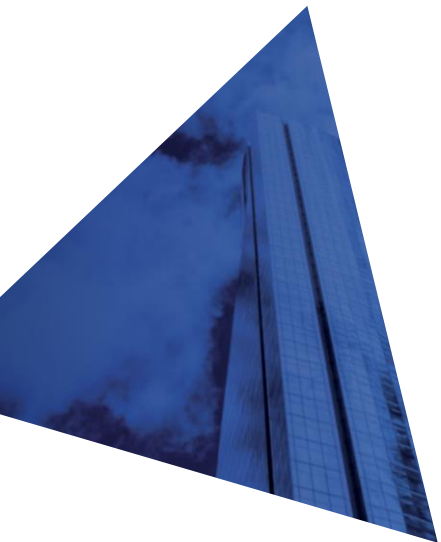
- Chapter 12 focuses on credit risks (in opposition to performance risks) and discusses two types of products:
 - Partial Credit Guarantee (PCG)
 - Energy Savings Insurance (ESI)

Chapter 13 – Energy Efficiency Project Finance Evaluation Tools

- Chapter 13 presents a series of checklists that can be used by credit and loan officers.
 - Risk Mitigation Checklist
 - IGA Checklist
 - Loan Application Guidelines and Checklist



IEEFP Training Program



- The IEEFP provides concepts and guidelines to facilitate an understanding by loan, risk, and credit officers of the key elements needed to evaluate and deliver attractive EE Project loans to facility owners, ESCOs, and other potential developers and implementers of EE Projects.
- It is not intended to be a training manual or a comprehensive document explaining all aspects of energy efficiency, EE Projects, or related financing.
- However, learning how to apply the concepts and guidelines in the IEEFP can be acquired by attending EVO's IEEFP Training Program, which provides hands-on training on using specific tools, project-based templates, and materials provided as part of the program.

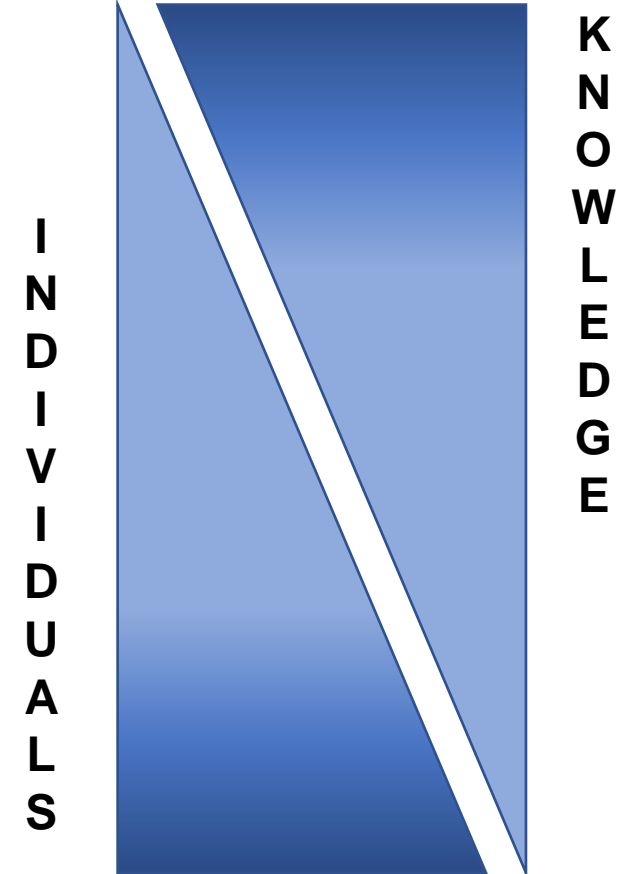
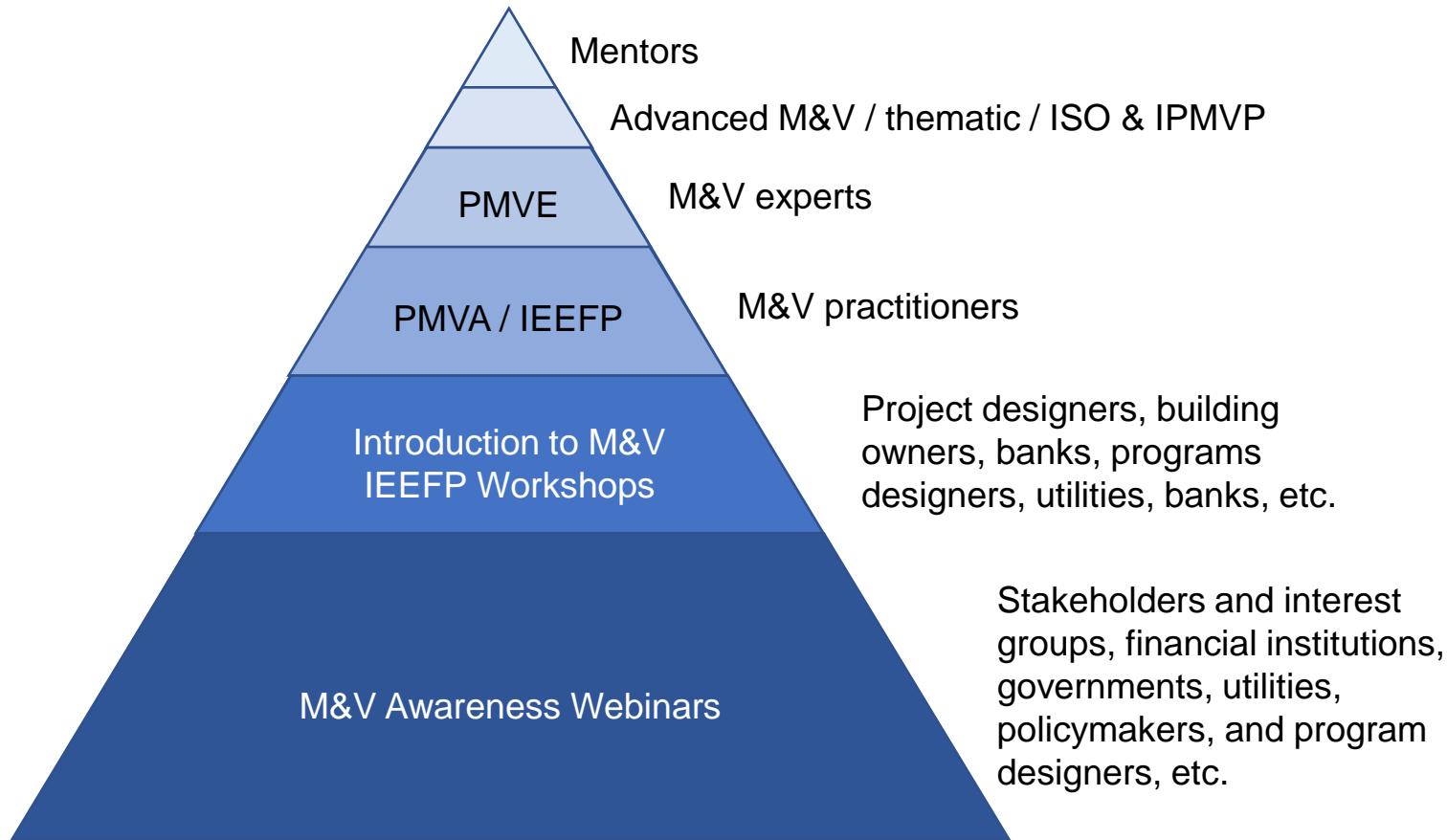
Introduction to financial terms

Introduction to EE technologies

12 training modules over two days
+
practical loan application group exercises

Advanced cash flow analysis course over two days, including a certification exam

Market transformation



Why financial institutions should know about the IEEFP

THERE ARE MANY REASONS WHY FINANCIAL INSTITUTIONS NEED TO KNOW THIS PROTOCOL:

1. The pressure to finance sustainable projects will increase for banks (Glasgow COP26, for example),
2. Energy efficiency is one of the primary vehicles for mitigation and decarbonization
3. Banks don't need to understand technical details but need to understand the rationale behind energy efficiency and its different ways to achieve it
4. Banks need to use a standard "technical-financial" language to promote, identify and analyze projects
5. Within the categorization of sustainable projects, energy efficiency is the most evident
6. Energy efficiency projects have credit quality if accompanied and justified with M&V – Performance M&V is itself a way to mitigate risk
7. Energy efficiency projects have a solid financial and productivity component for the benefit of those who execute them
8. Banks should take an active role in promoting energy efficiency accompanied by M&V
9. The only way to demonstrate efficiency and low risk is through M&V
10. M&V forces technology providers to become professional



Efficiency
Valuation
Organization

Thank you !

dtanguay@evo-world.org