Efficiency Valuation Organization

ANNUAL REPORT 2020

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MESSAGE FROM THE CHAIRMAN

2020 was an exciting yet challenging year for EVO. Needless to say, our core activities were affected by uncertainties resulting from the emerging global COVID crisis.

Resilience and adaptation to this new reality quickly became the focus of our attention in the first half of the year. Our training partners throughout the world adapted their operations, and online training became the norm. While training activites paused in the first six months of the year, the numbers of online sessions increased during the second half. Thanks to these efforts by our partners and our staff, EVO managed to weather the difficult conditions admirably, and post a very successful result.

From a product development perspective, we started 2020 with the publication of a white paper on advanced measurement and verification in January. The *IPMVP's Snapshot on Advanced Measurement and Verifiction* provides an overview of the technical state-of-the-art in advanced M&V and associated industry activities, and resulted from valuable prior discussions between experts. Their engagement to keep discussing this important topic continued throughout the year, and will extend well in to 2021 with the objective of developing a comprehensive IPMVP application guide.

In 2020, we also launched a review of the *IPMVP Core Concepts*. We issued an international call for comments in February which also included all published IPMVP application guides. It is expected that this major overhaul of the IPMVP will be completed by the end of 2021.

We also published an overdue update of the *International Energy Efficiency Financing Protocol (IEEFP)* in English and French, accompanied by an *IEEFP Annex for Canada*. The upate was made possible by a financial contribution from the Government of Canada's Department of Natural Resources and included the development of a two-day training program. The training was piloted in four sessions from May 26 to June 3, with participants from a variety of disciplines including financial institutions, ESCOs, and government officials.

Finally, another significant technical guidance document was published in October: the *IPMVP Application Guide on Non-Routine Events and Adjustments*, with detailed risk mitigation methods that can be used by stakeholders to manage such events. This publication was timely, with the COVID-19 pandemic presenting the biggest non-routine event of recent times that has impacted energy use in all economic sectors.

On top of this intensive protocol development agenda, the EVO Board of Directors also decided it was time to perform a strategic review of our activities to ensure EVO's structures and processes position us well for the future. This process led to the creation of two new overarching committees: the Product and Technical Working Group (PTWG) and the Outreach and Market Development Working Group (OMDWG).

The PTWG takes responsibility for resource allocation that ensures technical rigour and applicability of existing EVO products, and any new product development activity. It supersede previous product-related working groups while maintaining and recognizing the need for ongoing technical engagement. The intent is to create a whole-of-EVO strategic direction over existing product refinements and new product development. It is comprised of members from these existing groups, as well as selected Board members, staff and volunteers.

The purpose of the OMDWG is to identify outreach opportunities, be more systemic in our outreach efforts, and harness the right people in the EVO network to take concrete actions and follow through. The OMDWG was put together concomitantly with the PTWG, to create bridges internally within EVO, and raise the profile of M&V to capitalise on current global opportunities and build new markets. Over time, the board anticipates that both groups will improve EVO's market presence and reinforce the role of the IPMVP as the gold standard of M&V.

EVO's work on strategic planning during the year and the structures we have put in place should guide us in the next few years on how to build momentum with key partners in different markets. Our vision to create a world that has confidence in energy efficiency as a reliable and sustainable energy resource, and our mission to ensure that the savings and impact of energy efficiency and sustainability projects are accurately measured and verified, is more relevant than ever with interest steadily growing in energy efficiency as a cost-effective decarbonization strategy.

The EVO Board clearly sees a renewed and expanded role for M&V in the years to come. The global energy transition calls for actions that produce credible results, and M&V remains key to unlocking energy efficiency finance at the scale the transition demands.

In closing, on behalf of the EVO Board of Directors and staff, I would like to recognize the tremendous work accomplished and contributions made by volunteers and experts from all over the world, in sharing their valuable expertise on our technical and training committees. You are the lifeblood of EVO and your ongoing dedication to making M&V a key component of energy efficiency projects and business transactions is commendable and appreciated.

I am looking forword to continuing working with you all throughout a safer and brighter 2021.

Mark Lister

Chairman

GOVERNANCE

BOARD OF DIRECTORS (AS OF DECEMBER 31, 2020)

EVO's Directors are selected with the objective of securing Directors representing a geographic and demographic cross-section of users of EVO Protocols.

Chair
Mark Lister
Asia Clean Energy Partners Limited
Australia

Treasurer
Thomas K. Dreessen
Chief Executive Officer
EPS Capital
Indonesia

Donald Gilligan
President of the National Association of Energy Service Companies (NAESCO)
United States

Vice Chair
Neil Salisbury
Managing Director
Point Advisory
Australia

Secretary
Laura Van Wie McGrory
Strategic Initiatives
Alliance to Save Energy
USA

Dr. Jan Rosenow
Director of European Programmes
Regulatory Assistance Project
United Kingdom

Past Chair
Pierre Langlois
President, Econoler
Canada

Phil Coleman
Lawrence Berkeley National Laboratory (LBNL)
United States

Yamina Saheb
Senior Energy and Climate Policy Analyst
OPENEXP
France

STAFF

EVO's day-to-day operations are performed by staff located in Montréal (Canada), Mexico City (Mexico) and Sofia (Bulgaria) with complementary administrative, legal and accounting resources in Washington DC (United States).

Denis Tanguay
Executive Director
Canada

Desislava Borisova
Training Director
Bulgaria

Monica Perez Ortiz
Director of Programs
Mexico

EVO'S COMMITTEES

IPMVP Committee

The IPMVP Committee serves as EVO's authority on state of the art in M&V and acts as the guardian of the IPMVP Core Concepts. It is responsible for all technical aspects of EVO publication and educational materials in the field.

All committee members have technical credentials in energy efficiency and M&V. The committee's makeup reflects a balance of energy users, energy suppliers, energy efficiency service suppliers, verifiers of energy savings reports, measurement equipment suppliers, and academics.

Specifically, the IPMVP committee:

- updates the IPMVP Core Concepts and related application guides;
- helps maintain all M&V related EVO publications and EVO technical materials on the website;
- responds to requests for clarifications changes or additions in EVO's technical documentation;
- obtains external review of EVO M&V publications as needed;
- recommends M&V related documents for publication;
- supports appropriate programs and procedures to promote the continued development and dissemination of good M&V practice;
- reviews and approves M&V related training materials used by EVO;
- participates in M&V associated forums on the EVO website;
- monitors publications by others and public discussions on M&V topics;
- recommends listings of any relevant resources of interest to the M&V community on the EVO website; and,
- identifies and implements the development of new M&V materials for inclusion in the EVO family of documents and the EVO website.

The IPMVP Core Concepts provides the general M&V framework and structure. It gives the general direction to select the IPMVP options that best fit an energy efficiency project and prepare and deploy the relevant IPMVP adherent M&V plans.

In 2020, the IPMVP Committee initiated a major overhaul of the IPMVP Core Concepts to publish a revised version in 2021. Committee members also continued their development work on many application guides.

The following sub-committees were particularly active in 2020:

- M&V for Energy Performance Contracting
- Statistics and Uncertainty for IPMVP
- Evaluation Measurement & Verification

Next year, the subcommittee on IPMVP and Water Application will continue its development work, and the subcommittee on IPMVP and Renewables will reconvene to prepare an update for publication in 2022.

The M&V Plans subcommittee finalized its work on M&V Plan templates which are now available for downloads in the subscribers' area on EVO's website. The Advanced M&V sub-committee produced a draft White Paper that was published in January 2020. The group continued its effort throughout the year to prepare a complete application guide on this topic.

An IPMVP Application Guide on Non-Routine Events and Adjustments was released in October. The guide presents detailed risk mitigation methods that stakeholders can use to manage non-routine events and adjustments. The document proved to be very helpful to many organizations and provide practical guidance in the context of COVID.

Training Committee (TC) and Extended Training Committee (ETC)

The training committee is primarily responsible for establishing procedures to help day-to-day management and delivery of M&V training and certification. In cooperation with EVO staff, the TC coordinates EVO's training development and operations.

The TC establishes and maintains procedures for the mentoring of new M&V instructors. It maintains qualification criteria for EVO instructors and has the final authority to select suitable instructor candidates. The TC reviews training event evaluations and responses from trainees, clients, and instructors.

The TC and the ETC identify the need for new M&V training products or services and recommend to the EVO board of directors any proposed contract to develop such. They review and discuss exam results to determine whether any changes are needed in the training or examination materials.

A decision was made in 2020 to merge the activities of the TC and the ETC. The objective is to improve the information flow and exchange between instructors. The new committee structure should be in place sometime in 2021.

TC/ETC – IPMVP Discussion Group

The TC/ETC – IPMVP Discussion Group was established in 2017 to create a channel between the TC and the IPMVP committees to address common issues and concerns emerging from the changes and additions to the IPMVP Core Concepts and various application guides.

EVO's instructors deliver an average of 60 classes per year and reach out to 800-1000 trainees annually. Through their interactions with trainees, instructors receive a multitude of comments and questions regarding various technical aspects of the IPMVP Core Concepts. To ensure that the training material reflects well the technical content of the IPMVP Core Concepts, the TC wanted to have an official viewpoint from the authors of the protocol, hence the establishment of the discussion group.

In 2020, the group continued discussing different topics as prompted by comments received from instructors as well as training participants. The group focuses on ensuring that the training materials match the content of revised protocols and new application guides. This work is fundamental to the continued improvement of EVO's documentation.

TRAINING COMMITTEE

Chair
Daniel Magnet
M&V Expert and Facilitator
EPC and DSM projects
France

Vice Chair
Antonio Miranda
M&V Expert, Commercial and Industrial Sectors
Spain

Steve Kromer
Energy Efficiency Consultant
Chairman of CMVP Board
USA

EXTENDED TRAINING COMMITTEE

Chair
Bruce Rowse
Consultant
8020Green
Australia

Chris Balbach
VP of R&D
Performance Systems Development
USA

Paul Calberg-Elen
Energy Engineer
Biomasse Normandie
France

Marco Correia
Senior Technician
Agência para a Energia (Portuguese Energy Agency)
Portugal

Sandeep Dahiya
Freelance Energy Engineer
India

Kar Kit Chu (Gary)
Energy Consultant
New Vector Engineering Design & Consultancy Co., Ltd.
Hong Kong

Daniele Forni
Chief technical officer
Federazione Italiana per l'uso Razionale dell'Energia
Italy

Agenor Gomez Pinto Garcia
Techincal Director
CTC Experts
Brazil

Rajvant Nijjhar
Principal
iVEES
United Kingdom

IPMVP COMMITTEE

Chair
Tracy Philips
7th Gen Energy Solutions
USA

Vice Chair Margaret Selig
Siemens Government Technologies
USA

Todd Amundson
Bonneville Power Administration
USA

Jim Bradford
Mesa Point Energy
USA

Ellen Franconi
Pacific Northwest National Laboratory (PNNL)
USA

David Jump
kW Engineering
USA

Sami Khawaja
Cadmus Group Inc.
USA

Bill Koran
Quality Energy Analysis
USA

David Korn
Ridgeline Energy Analytics
USA

Ken Lau
BC Hydro
Canada

Christian Lemieux
Econoler
Canada

Gregory Bonser
Independant Electricity System Operator (IESO)
Canada

Luis Castanheira
ICP Europe
Portugal

Phil Combs
Trane Energy Services & Controls
USA

Shankar Earni
Lawrence Berkeley National Laboratory
USA

Eric Mazzi
Mazzi Consulting Services
Canada

Scott Noyes
iEnergy
New Zealand

Christophe Rodriguez
dalkia smart building – Groupe EDF
France

Jessi Smith
Demand Side Analytics
USA

Kevin Warren
Warren Energy Engineering
USA

Jim Zarkse
Nexant
USA

Lia Webster
Facility Energy Solutions
USA

HIGHLIGHTS

EVO in Action 2020 Timeline

JANUARY

- On January 7, the Board of Directors appointed new officers for the period 2020-21. Mark Lister accepted his nomination and appointment as Chairman of the corporation. Laura Van Wie McGrory joined the executive committee and was appointed as Secretary. Neil Salisbury and Tom Dreessen were re-appointed in their positions of Vice-Chair and Treasurer. Pierre Langlois, who served as Chair in 2018 and 2019, became Past-Chair.

- EVO announced the release of a white paper entitled ***IPMVP's Snapshot on Advanced Measurement & Verification***. This paper represents an overview of advanced measurement and verification (M&V) technical state of the art and current industry activities. This release provides the groundwork for EVO's IPMVP Application Guide on advanced M&V.

FEBRUARY

- Following its policies and procedures, EVO officially launched the review of the International Performance Measurement and Verification Protocol (IPMVP) Core Concepts. EVO invited comments from the international M&V community, including individuals, institutions, and organizations that may wish to make recommendations to improve the IPMVP Core Concepts. The statutory review also includes the following application guides: Uncertainty Assessment for IPMVP, Measurement and Verification Issues and Examples, and Renewables Application Guide.

MARCH

- A series of live online sessions of the ***ISO 500015 and the IPMVP Course*** took place through the month. Offered since 2016, this course covers the ISO 50015 M&V guidance standard and how to use it in conjunction with the world's most widely used Protocol, the IPMVP with minimum duplication effort.

APRIL

- Kevin Warren and Lia Webster, members of the IPMVP Committee, made presentations at a webinar organized by NEEP on: ***Protocols for Advanced M & V: Helping You See Clearly***. Kevin presented on: ***An Evaluation and Portfolio Perspective on AM&V***. Lia presented on: ***The Project Perspective: Technical Issues and New EVO Publications***.

- A webinar on M&V, EVO and the IPMVP in Mexico was organized in cooperation with AMENEER, EVO's training partner in Mexico, as well as with SENER and CONUEE. Presenters included Raúl Ortega from AMENEER and Monica Pérez from EVO, explaining the collaborative efforts deployed by various stakeholders to promote M&V in the country. Vanessa Tirado López, an accredited EVO instructor, provided a short introduction to M&V and the IPMVP. Rajvant Nijjhar, another EVO accredited instructor based in the United Kingdom made a presentation on ISO 50015 and the IPMVP.

SENER
SECRETARÍA DE ENERGÍA

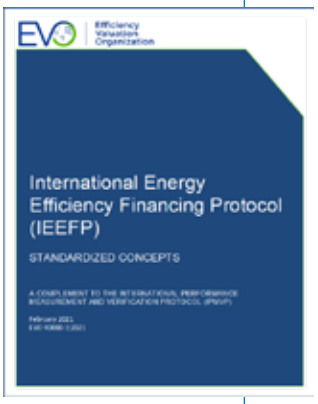
CONUEE
Comisión Nacional para el Uso Eficiente de la Energía

AMENEER

EVO | Efficiency Valuation Organization

MAY

- After working on the update of the ***International Energy Efficiency Financing Protocol (IEEFP)*** throughout 2019 and early 2020, EVO released the document in both English and French. An IEEFP Annex for Canada was also published. The update of the *IEEFP* was made possible by a financial contribution from the Government of Canada's Department of Natural Resources.



- First scheduled to take place in March, but cancelled due to COVID, the IEEFP Training Program was rescheduled and offered online in fours sessions from May 26 to June 3. The sessions were held under the direction of Tom Dreessen (EVO's Treasurer) who designed and developed the training program. In total, 28 participants from financial institutions, ESCOs and firms specializing in M&V attended the sessions. During the online pilot sessions, two Canadian instructors were trained for future training delivery in English and French. EVO also welcomed participants from Mexico in preparation for the translation of the protocol into Spanish as well as the development of An IEEFP Annex for Mexico.

JUNE

- As part of its outreach activities, EVO's Executive Director, Denis Tanguay, made a brief presentation of EVO's capacity building activities during an L2 class held in Brazil. The Level 2 (L2) training program offers a structured introduction to M&V. This short program aimed at presenting the basic concepts of M&V and of the four options of the IPMVP to a large audience in government (policy and program), utilities, building owners and managers, financial institutions, etc.

- Lia Webster, Chair of the IPMVP Sub-Committee on Advanced M&V, made a presentation at a webinar organized by the Clean Energy Business Council – Middle East & North Africa on ***The Impact of COVID-19 on the ESCO M&V Activities***. Lia's presentation focused on non-routine events and non-routine adjustments within the IPMVP framework.

- Held annually, the Asian Clean Energy Forum is an excellent opportunity to create awareness on the importance of developing sound M&V procedures and how to introduce reliable M&V protocols at project design. EVO, the Asian Development Bank and EPS Capital Corp., co-hosted a side event webinar entitled "Measuring Energy Efficiency Results: International Best Practices and Examples."
  - » EVO's Treasurer, Thoman Dreessen, presented on: ***EE Project Best Practice Street Lighting Project M&V Example***.
  - » EVO's Chaiman, Mark Lister, presented on: ***EE Project M&V Training and Certification Solutions***.

- EVO's Executive Director, Denis Tanguay, made a presentation at a webinar organized by Energis. The webinar discussed how advanced software can facilitate M&V. Denis provided a quick snapshot of EVO capacity building activities and protocol development updates. Energis is a green-tech company based in Belgium (Brussels and Louvain-la-Neuve) and in Italy (Caserta). The company provides SMART Energy Management solutions, based on Energis.Cloud and Raspicy,

JULY

- On July 7, EVO's Executive Director, Denis Tanguay, presented an update on EVO's capacity building activities with a focus on the IPMVP update and the development of various application guides during an online webinar organize by FIRE, EVO's training partner in Italy.

- On July 21, Phil Coleman, an EVO Board member, along with NREL's Phil Voss and ORNL's Christine Walker, co-led a three-hour M&V webinar for about 80 U.S. General Service Administration employees. The event covered introductory and intermediate material - and was geared primarily for U.S. federal ESPC.

- EVO's Executive Director, Denis Tanguay, was invited to make a short intervention during an L3 class held online in Australia. Denis provided some update on the IPMVP revision process as well as advanced training development activities.

AUGUST

- Reflecting increased demand for EVO's M&V training programs in Saudi Arabia and Belgium, four new L3 (Level 3) instructors were approved by EVO's Training Committee.
  - » Bassam Abdel-Karim ABU-HIJLEH – Saudi Arabia
  - » Hassan Ali YOUNES – Saudi Arabia
  - » Lieven COLARDYN – Belgium
  - » Sven WUYTS – Belgium

- David Jump, a long-time serving member of the IPMVP Committee presented a paper and communication titled: ***Playing the Long Game: Case Studies of Three Meter-Based Programs*** during an ACEEE event.

SEPTEMBER

- On behalf of the Active Efficiency Collaborative, Laura Van Wie McGrory (Alliance to Save Energy) and EVO Board member, hosted a series of four multi-stakeholder workshops during September-November 2020 to explore how performance-based utility programs can accelerate deep energy retrofits and enhance demand flexibility. Participation ranged between 35-65 people and included utilities, ESCOs, manufacturers, building owners, federal and state government agencies, national laboratories, and researchers. M&V was a key topic discussed in each workshop and IPMVP was referenced in numerous discussions as a best practice.

- Bruce Rowse, Chairman of EVO's Extended Training Committee and accredited instructor in Australia did his annual University of Melbourne lecture on M&V & IPMVP.

- EVO signed a Training Organizer agreement with Envidatech for training in Germany, Ukraine, Qatar and Pakistan.

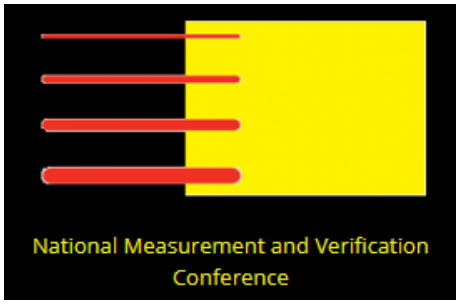
- Denis Tanguay, EVO's Executive Director, made introductory remarks at the beginning of an L2 course in Mexico. The course organized by AMENEER had 28 participants.

- Monica Pérez, EVO's Program Director, made a presentation on EVO during an L3 class held in Brazil.

OCTOBER

- Eric Mazzi, a member of the IPMVP Committee delivered a talk (virtually) to the Association of Energy Engineers - Alberta chapter on Oct 1, 2020. It was a webinar titled: *7 (Not So) Hidden Secrets for Effective M&V of Energy Efficiency Projects*. The talk also included overview information on EVO and the IPMVP

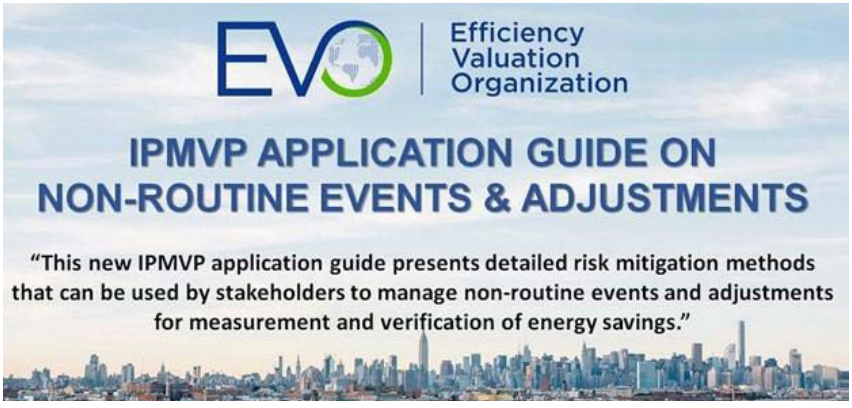
- Bill Koran, a long time IPMVP Committee member spoke at MAVCON 2020 on: *"M&V 2.0: Leveraging High Frequency Data*.



- The Italian Federation for Energy Efficiency (FIRE), EVO's training partner in Italy, held its annual conference on M&V during KEYENERGY 2020. Daniele Forni, member of EVO's Extended Training Committee and M&V instructor made a presentation on the ***Measurement and Verification of Energy Savings*** and Lia Webster, member of the IPMVP Committee, presented on ***IPMVP: Advanced M&V and Non-Routine Adjustments***.

- EVO announced the release of the ***Template for the development of an IPMVP adherent M&V Plan***, elaborated by the IPMVP Committee through the M&V Plans Subcommittee. This template is based on the adherence criteria outlined in the Core Concepts (EVO 10000-1:2016),

- EVO released an ***IPMVP Application Guide on Non-Routine Events and Adjustments***. This application guide presents detailed risk mitigation methods that can be used by stakeholders to manage non-routine events and adjustments. Moderating these risks is paramount when M&V is the basis for monetary transactions, including energy service company (ESCO) projects and 'pay for performance' utility projects and programs.



NOVEMBER

- Following the release of the ***IPMVP Application Guide on Non-Routine Events and Adjustments***, EVO organized a webinar series on Managing Impact from COVID19 in Meter-Based M&V.

November 4: ***Rollout of IPMVP Application Guide on NRE/A***

November 11: ***Managing COVID19 - Advanced M&V Methods***

November 18: ***Managing COVID19 -IPMVP & Beyond***

PRESENTERS INCLUDED:

Lia WEBSTER, *Facility Energy Solutions*

Steve KROMER, *SKEE*

Anna KELLY, *M&V Lead/Senior Data Scientist, Power TakeOff*

Kevin CAMPBELL, *Project Manager, Energy 350*

Brian CLIPPINGER, *Energy System Group*

Greg ANDERSON, *Gridium*

Patrick O'SHEI, *Director of Market Development, NYSERDA*

Lionel METCHOP, *Puget Sound Energy*

- On November 26-27, EVO training partner in Tunisia, PECO Energy, co-hosted a workshop with the Tunisian Professional Association of Banks and Financial Institutions (APTBEF) on green finance and climate finance. The workshop, "Énergie verte et financement du climat: Atelier sur les outils de financement et l'évaluation des besoins en capacités dans le secteur bancaire. » was held in French and English.
  - » Thomas Dreessen, EVO's Treasurer, presented on: ***Energy Efficiency Finance Solutions: Energy Savings Performance Contracting (ESPC) and International Energy Efficiency Financing Protocol (IEEFP)***.
  - » Daniel Magnet, Chair of EVO's Training Committee presented on: ***De-Risking Energy Efficiency Investments par une application correcte de la garantie de résultats énergétiques***.
  - » Denis Tanguay, EVO's Executive Director, presented on: ***Financement des projets d'efficacité énergétique: Gestion du risque et Protocole international de financement de l'efficacité énergétique (PIFEÉ)***.

- **MAVCON 2020** continued through November. On November 19, Lia Webster from Facility Energy Solutions and IPMVP Committee member presented the ***IPMVP Application Guide on Non-Routine Events and Adjustments***. On November 29, Dr Hilary Wood, EEVS and one of the UK's EVO accredited instructors, made a presentation on: ***Dealing with uncertainty***.

DECEMBER

- EVO's Chairman, Mark Lister, presented at the 13th webinar of the User-Centred Energy Systems Academy (UsersCP) titled: ***Time to step up performance-based energy efficiency measurement and verification efforts in Europe.***

GLOBAL ESCO NETWORK

The Global ESCO Network (GEN) was established in June 2019 to be the global driver and inspire government actions for scaling up the contribution of ESCOs to the global response for mitigating the threat of climate change.

To realize this, it is the Mission of the GEN to add to and reinforce existing efforts of National and Regional ESCO Associations to promote increased activities by the ESCO Sector at a global scale by:

- working for formal recognition of the ESCO sector as a pathway for countries to strengthen and achieve energy efficiency ambitions in their Nationally Determined Contributions (NDCs) under the Paris Agreement on Climate Change;
- supporting a better understanding within the finance sector of the value and validity of energy performance contracting, enabling investors to engage in the provision of financial resources that facilitates a decisive scale-up of the reach and depth of ESCO activities;
- documenting the benefits of applying ESCO principles in business and policy development through international mapping and benchmarking of framework conditions for the successful operation of ESCOs and their achievement of material energy savings;
- actively promoting the establishment of ESCO associations and ESCO-related policies in countries where ESCOs are yet to establish a market foothold;
- widely disseminating knowledge related to best practices in policy and business development related to ESCOs, and raising awareness among policymakers of financially attractive models for energy efficiency improvements;
- acting as a platform for the exchange of knowledge and experience among National and Regional ESCO Associations on all aspects of ESCO operation, aiming at distilling central issues to inform any of the activities mentioned above;
- convening experts and operating a repository of authoritative literature and other sources of information to establish the Global ESCO Network as the go-to resource for any issue pertaining to ESCOs and their promotion as the central concept for implementing energy efficiency investments.

Rationale

Energy Service Companies - ESCOs - deploy a business model directly responding to the global climate change challenge. By directly using energy savings to pay for the cost of equipment and infrastructure that creates those savings, ESCOs challenge the mantra that emissions reduction activity comes at a cost that many, particularly in developing countries, cannot carry. In the business of climate change, ESCOs deliver some of the best returns on investment, reducing energy consumption while combating excess GHG emissions as a significant co-benefit.

ESCOs are not always well recognized as an industry nor entrenched in national policies. Nowhere has their full potential been unleashed, and in many places, they still struggle to find a sufficient foothold. In some sectors and some countries, however, they are thriving, but rarely due to dedicated policies that promote the understanding of reduced energy expenses as an investable asset class, nor the techniques and requirements of successful and widespread Energy Performance Contracting.

In many countries, ESCO Associations work to promote the interests of their members for the establishment of business conditions commensurate with the immense economic and GHG mitigation potentials of energy efficiency for countries and industries alike. These associations address similar challenges but do so individually. While the associations do cover the most energy-intensive economies, they remain a minority that may benefit from expanding the group of ESCO Associations to raise a global voice in global forums in support of Energy Performance Contracting.

The growing urgency of decisive responses to a rapidly changing climate, and the inherent ESCO promise of delivering profitable investments to the same effect, suggests a potentially prominent role of energy efficiency and, as its agents, the global ESCO community in the global climate change agenda, from the highest UN level to the grassroots. However, this is a role that the ESCO concept is yet to attain.

Therefore, the **Global ESCO Network** works to elevate issues and concepts related to ESCOs to the highest possible level on the international climate policy agenda. Key functions of the Global ESCO Network include:

- ESCO advocacy in national and international fora for the currency and relevance of the ESCO approach to accelerating climate change mitigation;
- global-scale research and information dissemination about issues relevant to the proliferation of ESCOs, and;
- coordinated approaches to securing resources and funding for developing policies, training programs, and enabling environments favorable to ESCO market growth.

STRUCTURE

The Global ESCO Network – with its Secretariat anchored in the Copenhagen Centre for Energy Efficiency (CCEE) – and the Efficiency Valuation Organization (EVO), have entered a Memorandum of Understanding in 2020 for the operation of the Network.

CCEE is the global thematic hub for energy efficiency of the UN Secretary General's Sustainable Energy for All (SEforALL) initiative. It is further part of the formalized collaboration between the United Nations Environment Programme and the Technical University of Denmark (UNEP-DTU Partnership) based at the UN City complex in Copenhagen.

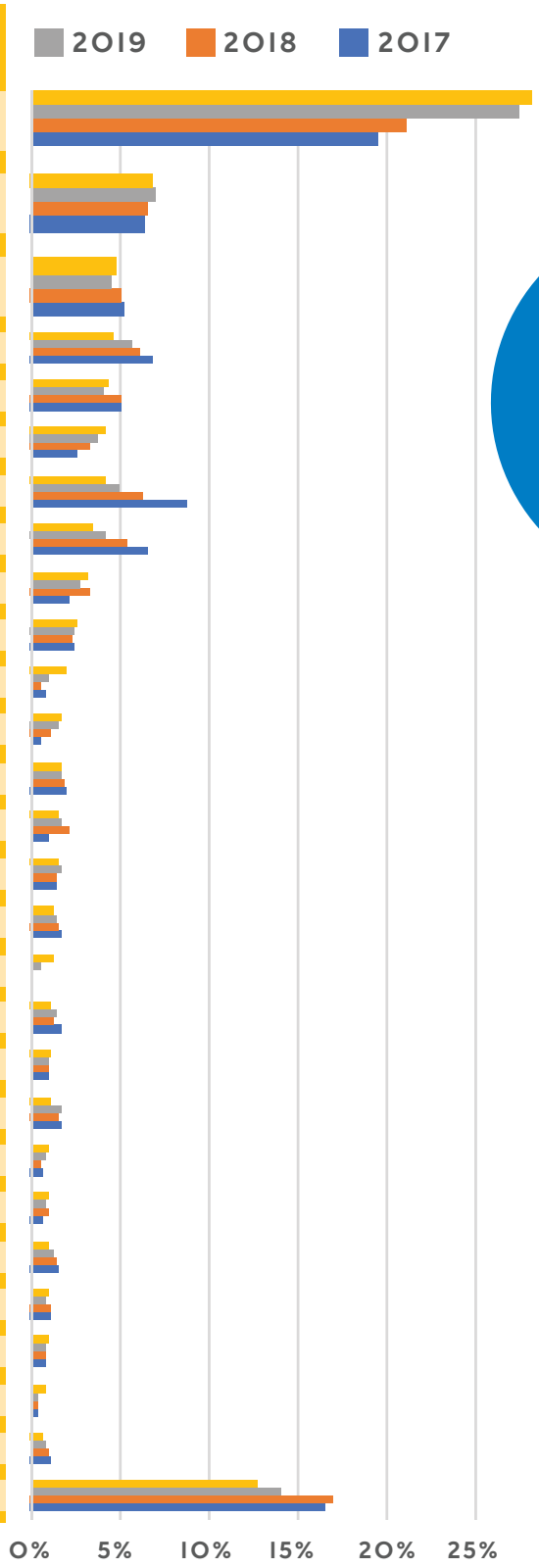
EVO is a non-profit organization whose products and services help people engineer and invest in energy efficiency projects worldwide. EVO's Vision is to create a world that has confidence in energy efficiency as a reliable and sustainable energy resource. EVO's Mission is to ensure that the savings and impact of energy efficiency and sustainability projects are accurately measured and verified.

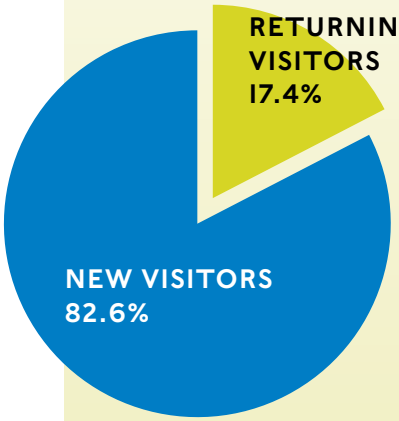
The Global ESCO Network operates without formal membership but will build on associating existing National and Regional ESCO Associations and global bodies related to ESCO sector development. The Global ESCO Network is mindful of reinforcing rather than duplicating efforts of associations.

EVO Website Visitors

WEBSITE VISITORS BY REGION

2020	
UNITED STATES	28.2%
CANADA	6.9%
UNITED KINGDOM	4.8%
BRAZIL	4.6%
FRANCE	4.4%
INDIA	4.2%
ITALY	4.2%
SPAIN	3.4%
UNITED ARAB EMIRATES	3.2%
AUSTRALIA	2.6%
NETHERLANDS	2.0%
SAUDI ARABIA	1.7%
SOUTH KOREA	1.6%
MEXICO	1.6%
BELGIUM	1.5%
GERMANY	1.3%
FINLAND	1.3%
PORTUGAL	1.2%
SOUTH AFRICA	1.1%
TAIWAN	1.1%
SINGAPORE	1.0%
HONG KONG	1.0%
CHINA	0.9%
IRELAND	0.9%
MALAYSIA	0.9%
AUSTRIA	0.9%
SWITZERLANS	0.7%
ALL OTHER COUNTRIES	12.7%





VISITORS FROM 174 COUNTRIES

473,420 PAGEVIEWS – UP 11.2%

NUMBER OF USERS UP 20.2%

NUMBER OF SESSIONS UP 20.1%

NEW USERS UP 20.3%

M&V Focus
EVO's Measurement & Verification Magazine

MAY 2020 - M&V FOCUS ISSUE # 6

The first article of this issue of M&V Focus is an abstract of the EVO White Paper IPMVP's Snapshot on Advanced Measurement & Verification. The document discusses some of the issues raised in the context of work conducted by EVO's subcommittee on M&V 2.0. This work will lead the development of two Application Guides: 'Advanced Meter-Based M&V Methods' and 'Non-Routine Events and Non-routine Adjustments.' The first guide will be released in 2021 and the second was published in 2020.

In November 2019, EVO's training partner in Italy, the Federazione Italiana per l'uso Razionale dell'Energia (FIRE), organized a one-day conference on M&V in Rimini. We invited three of the event's speakers to present a summary of their presentation in this issue of M&V Focus.

- Alberto Griffa and Armando Portoraro explain how an in-depth analysis of critical factors was fundamental in the replacement of a drying line.
- Stefano Dotta provides an interesting example of ESCO projects realized under a shared saving scheme with a municipal union.
- Marco Rossi to prepare a simple case study of a series of energy conservation measures implemented at a Viessmann office and warehouse. The project M&V was performed using Option C and includes energy exchange with the local electricity grid.

Finally, Bruce Rowse describes the many different approaches with which data can be collected from a meter and transferred to the cloud. It introduces to M&V practitioners the widely used Open System Interconnection (OSI) model of computer networks for conceptualizing the functions of the software and hardware used to achieve this.

ADVANCED MEASUREMENT & VERIFICATION AND IPMVP

Lia Webster, Facility Energy Solutions, with contributions from Jessica Granderson, Samuel Fernandes, Eliot Crowe and Shankar Earni, Lawrence Berkely National Laboratory.

M&V NELLA RIQUALIFICAZIONE DI EDIFICI PUBBLICI

Stephano Dotta, Area Manager for Environment Park S.p.A.

AGGIUSTAMENTO DEI DATI DI RIFERIMENTO

Ing. Alberto Griffa, and Ing. Armando Portoraro, Ph.D, both with Trigenia.

M&V CASE STUDY – VIESSMANN ITALIA HEADQUARTERS

Marco Rossi, Energy Consultant and Marco Memoli, Junior Energy Consultant, both with Etanomics

FROM METER TO THE CLOUD: APPROACHES AND CHALLENGES IN GETTING DATA FROM REMOTE METERS

Bruce Rowse, 8020Green.

NOVEMBER 2020 - M&V FOCUS ISSUE # 7

In this issue of M&V Focus, Anna Kelly and Craig Sinnamon proposed a paper that analyzes daily and hourly energy efficiency projects using IPMVP Option C methods. They demonstrate that models can identify savings as low as 3 % of facility consumption.

Matheus Lage discusses M & V in public lighting in Brazil, focusing on comparing the methodologies used by the Energy Efficiency Program of the National Electric Energy Agency and by Eletrobras.

Saghi Salehi and Maryam Rezaie present a case study of natural gas consumption in a complex of administrative buildings with a single supplier meter to measure the energy consumption of 5 separate facilities and a restaurant. They discuss measurements of uncertainties and statistical errors.

Colin Grenville took us through another exciting case studies where a client decided to install solar PV on its property after an ESCO commissioned other ECMs, and without consideration of the ongoing M&V activity.

Phil Combs presents the outcome of a recent update of the ANSI C-137.5 standard that provides specifications regarding energy measurement from lighting systems and devices. This standard addresses M&V considerations such as uncertainty, error, precision, and calibration.

Finally, Paul Calberg-Ellen and Nathan Lee present French translations of eight articles published in M&V Focus in 2018 and 2019.

DETECTING SAVINGS UNDER 10% USING IPMVP OPTION C

Anna Kelly, Senior Data Scientists/M&V Lead at Power TakeOff

Craig Sinnamon, Machine Learning Engineer at Power TakeOff

A MEDIÇÃO & VERIFICAÇÃO NO BRASIL: AS DIFERENÇAS DE APLICAÇÃO NO CONTEXTO DA ILUMINAÇÃO PÚBLICA

Matheus Henrique de Morais Lage

SIGNIFICANT ENERGY USES AND THEIR IMPACTS ON ENERGY BASELINES ESTABLISHMENT

Saghi Salehi and Maryam Rezaie. This article was produced under Consortio Limited, United Kingdom.

ESTIMATING SOLAR PV EXPORT TO GRID

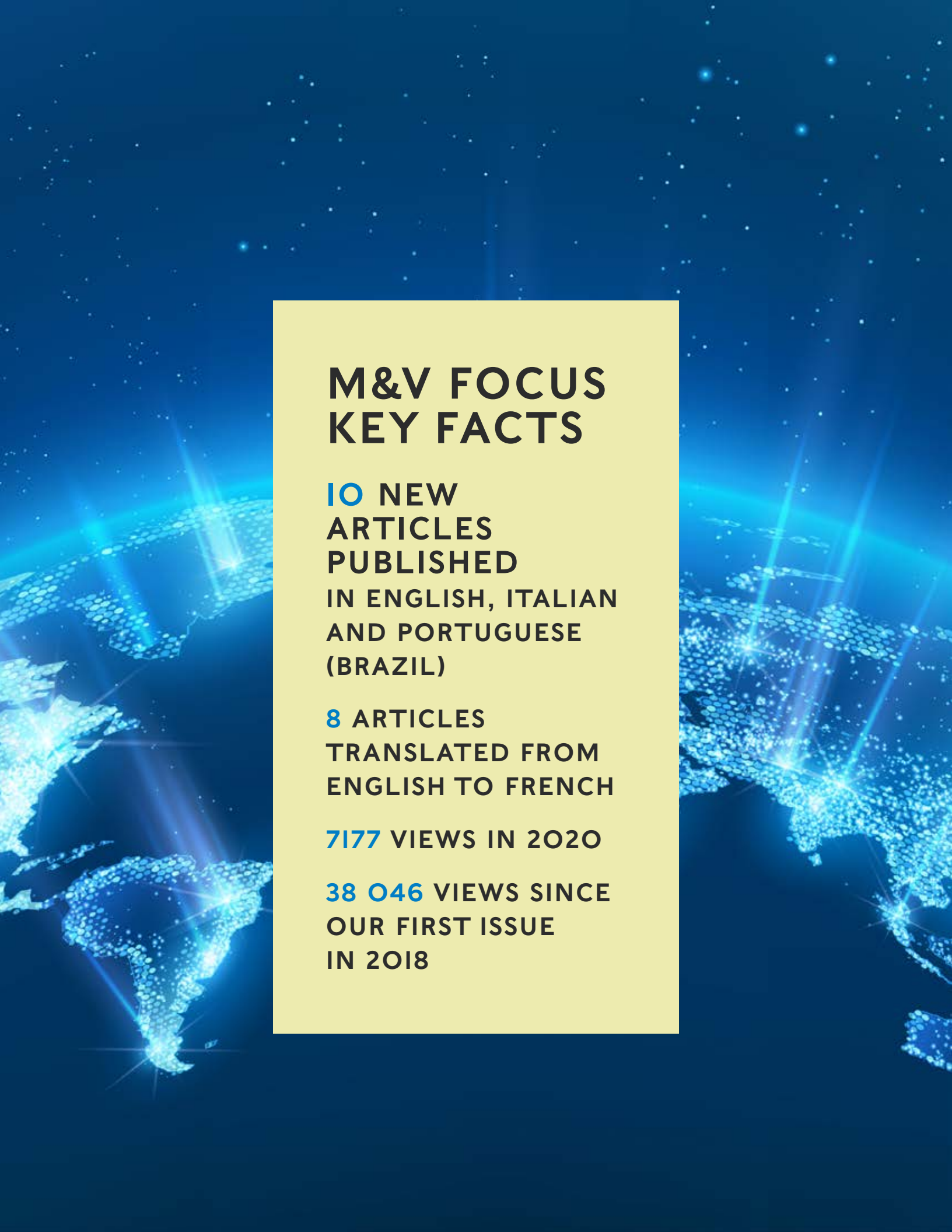
Colin Grenville, Director, Erebus Environment Limited

ANSI C137.5 UPDATE

Phil Combs, Engineer for Trane Technologies

ARTICLES M&V FOCUS EN FRANÇAIS!

Traductions réalisées par Nathan Lee et Paul Calberg-Ellen, Biomasse Normandie, dans le cadre d'une mission confiée par l'ADEME Normandie.



M&V FOCUS KEY FACTS

10 NEW ARTICLES PUBLISHED
IN ENGLISH, ITALIAN AND PORTUGUESE (BRAZIL)

8 ARTICLES TRANSLATED FROM ENGLISH TO FRENCH

7177 VIEWS IN 2020

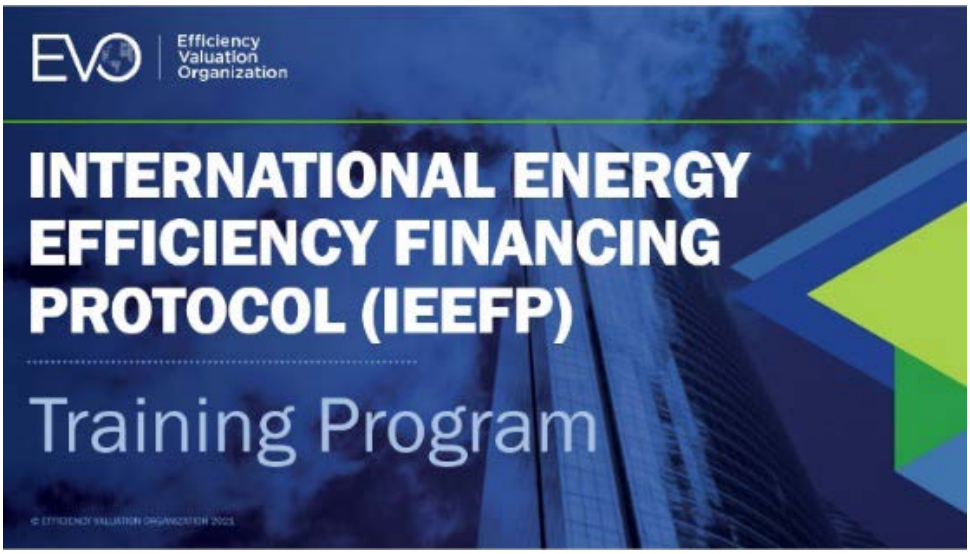
38 046 VIEWS SINCE OUR FIRST ISSUE IN 2018

CAPACITY BUILDING ACTIVITIES

Training Partners

AFNOR COMPÉTENCES GROUPE AFNOR	AGENCIA PARA A ENERGIA	ALLIANCE FOR AN ENERGY EFFICIENT ECONOMY	AMENEER	THE ASSOCIATION OF ENERGY ENGINEERS
BUREAU VERITAS	CANADIAN INSTITUTE FOR ENERGY TRAINING	CARBON AND ENERGY PROFESIONNALS NEW ZEALAND (CEP)	COLOURWAY TECH CO. LTD.	CONSEJO COLOMBIANO DE EFICIENCIA ENERGÉTICA
ENERGY EFFICIENCY COUNCIL	ENERGY EFFICIENCY VERIFICATION SPECIALISTS	ENERGY LAB	ENERGY SERVICES AND TECHNOLOGY ASSOCIATION	ENPAP 4.O INC.
ENVIDATECH GMBH	FEDERAZIONE ITALIANA PER L'USO RAZIONALE DELL' ENERGIA	GREEN PRODUCTIVITY FOUNDATION	INDEPENDENT VERIFIERS OF ENERGY EFFICIENCY SAVINGS	KFQ
KOREA ASSOCIATION OF ESCO	PECO ENERGY	SGS		

International Energy Efficiency Financing Protocol (IEEFP)



The International Energy Efficiency Financing Protocol (IEEFP) is a blueprint for educating credit, risk, and loan officers of local banks and other financial institutions (LFIs) around the world on the unique intricacies, benefits, and risks of energy efficiency projects (EEPs) and on the critical elements of structuring EEP loans on a low-risk, commercially attractive basis.

The goal of the IEEFP is to facilitate the willingness of LFIs to provide commercially attractive debt to EEPs by getting their credit risk and loan officers comfortable with proven energy efficiency (EE) technologies and the EEPs' ability to generate long-term savings that can be reliably measured and verified. The IEEFP provides a structured framework to make financing EE easier for LFIs.

RELEASE OF THE REVISED IEEFP AND THE ANNEX FOR CANADA

After working on updating the ***International Energy Efficiency Financing Protocol (IEEFP)*** throughout 2019 and early 2020, EVO released the document in both English and French. An IEEFP Annex for Canada was also published. The update of the *IEEFP* was made possible by a financial contribution from the Government of Canada's Department of Natural Resources.

Special thanks to the following individuals for their participation in various committees and input provided through interviews, workshops, and numerous bilateral discussions: *Ryan J. Beard, Valerie Bennett, Charles Bernardi, Karène Berthiaume, Brad Billingsley, Thomas Dreessen, François Dussault, Jonathan Frank, Stuart Galloway, Geneviève Gauthier, Ivan Gerginov, Mélanie Guilbert, Gabriel M. Habib, Chris Ireland, Hassaan Khan, Lucie Laflamme, Grant Macdonald, Edward Ng, Dany Pelletier, Gildas Poissonnier, Charles Quintal, Louis-Michel Raby, Chandra Ramadura, Caroline Rauhala, André Rochette, Evgenia Rolzing, Neil Salisbury, Éric Scalzo, Dave Seymour, Tim Stoate, Denis Tanguay, Melanie Torrie, Eric Vissier, Matt Zipchen, Barbara Zvan, Katie Zwick.*

SUCCESSFUL DEPLOYMENT OF IEEFP TRAINING IN CANADA

First scheduled to take place in March but canceled due to COVID, the IEEFP Training Program was rescheduled and offered online in four sessions from May 26 to June 3. The sessions were held under the direction of Tom Dreessen (EVO's Treasurer), who designed and developed the training program.

In total, 28 participants from financial institutions, ESCOs, and firms specializing in M&V attended the sessions. Two Canadian instructors were trained for future training delivery in English and French during the online pilot sessions.

NEXT STEP – DEVELOPMENT OF AN ANNEX FOR MEXICO

In the second half of 2020, EVO staff worked with Mexico's partners and stakeholders to translate the IEEFP into Spanish and develop an IEEFP Annex for Mexico. The project should materialize in 2021. The project will include the mentoring of instructors as well as one or more training sessions.

EVO-Approved Instructors

EVO-approved instructors are M&V experts authorized by EVO´s Training Committee to provide trainees with M&V trainings. Instructors have a teaching background and experience in the field of M&V. They are approved by the Training Committee and must renew their instructor status periodically. Based on the degree of knowledge and expertise in the M&V field, EVO qualifies instructors into three different levels: L2, L3, and L4, each of them with various attributions.

FEATURES AND SKILS OF EVERY INSTRUCTOR AT THE CORRESPONDING LEVEL

L2 INSTRUCTOR (INTRODUCTORY) – can teach only introductory training (up to 1-day). L2 instructors have a teaching background and experience in the field of M&V. They have been approved by the Training Committee and must renew their status every three years.

L3 INSTRUCTOR (M&V FUNDAMENTALS) – can teach the *M&V Fundamentals and IPMVP for Energy Managers* course. L3 instructors can also teach introductory L2 training. L3 instructors must meet all L2 instructor requirements, and additionally, they must have practical experience in M&V and preparation/implementation of M&V Plans. L3 instructors must go through a mentoring process before being formally approved by the Training Committee. They must renew their status every three years.

L4 INSTRUCTOR (ADVANCED) – can teach advanced M&V training. L4 instructors can also teach introductory classes as well as the *M&V Fundamentals and IPMVP for Energy Managers* course. L4 instructors must meet all L3 instructor requirements. Additionally, they must show an in-depth knowledge in one of the M&V topics. Before becoming an L4 instructor, the candidate must have delivered several times the *M&V Fundamentals and IPMVP for Energy Managers* course as an L3 instructor.

L4 instructors must go through a stringent evaluation process consisting of preparing a technical paper on a specific M&V topic and deliver a master class before being formally approved by the Training Committee. All L4 instructors must renew their status every three years.

Some L4 instructors can be qualified as a mentor. Mentors can evaluate candidate-instructors to become EVO-approved L3 instructors.

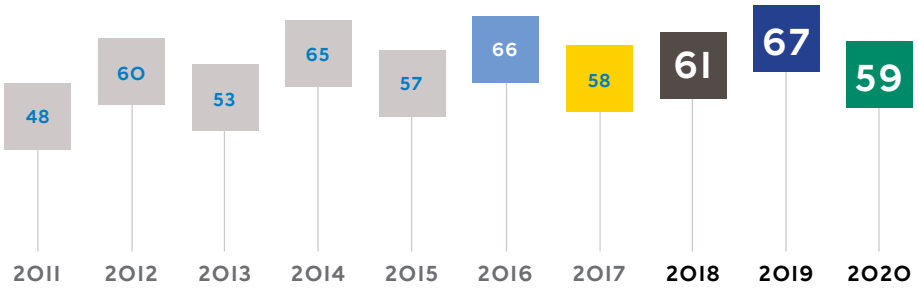
Instructors

LEVEL	INSTRUCTOR	LOCATION	LANGUAGE
LEVEL 4	Bruce Rowse	Australia	English
	Agenor Gomes Pinto Garcia	Brazil, Salvador	Portuguese (Brazil), Spanish
	Stephanie Nour	Canada	English, French, Spanish
	Sandeep Dahiya	India	English, Hindi
	Antonio Miranda	Spain	Spanish, English
	Daniel Magnet	Switzerland	French, English
	Steve Kromer	USA	English
LEVEL 3	Georg Trnka	Austria	German
	Markus Hofmann	Austria	German
	Dragos Paraschiv	Canada	English
	Eric Mazzi	Canada	English
	Genevieve Gauthier	Canada	French
	Guy Turgeon	Canada	French
	Sven Wuyts	Belgium	English, Dutch (Flemish)
	Jose Eduardo Nunes da Rocha	Brazil	Portuguese (Brazil)
	Fabio Atonio Filipini	Brazil	Portuguese (Brazil)
	Alvaro Soto	Chile	Spanish
	Kar Kit Chu	China	English, Mandarin Chinese
	Max Yimeng Zhang	China	Mandarin Chinese, English
	Paul Calberg-Ellen	France	French
	Frédéric Saint-André	France, Belgium, and Switzerland	French
	Ian Boylan	Ireland	English
	Daniele Forni	Italy	Italian, English
	Dolf Van Hattem	Italy	Italian, English, German, Dutch
	Ignace de Francqueville	Italy	Italian, English, French
	Ismael Alhinti	Jordan	Arabic, Engish
	Nermeen Asfour	Jordan	Arabic, Engish
	Fadi Marji	Jordan	Arabic, Engish
	Vanesa Tirado López	Mexico	Spanish
	Nadège Richard	Mexico	Spanish
	Amádis dos Santos	Portugal	English, Portuguese
	Marco A. Correia	Portugal	English, Portuguese
	Gorete Soares	Portugal	Portuguese, English
	Thamer Alquthami	Saudi Arabia	Arabic, Engish
	Abdullah Alabdulkarem	Saudi Arabia	Arabic, Engish
	Christo van der Merwe	South Africa	English
	Denis van Es	South Africa	English
	Jinsang Kim	South Korea	Korean
	Rafael Poquet Vitoria	Spain	Spanish, English
	Hung-Yao Chao	Taiwan	Mandarin, English
	Ming-Tsun Ke	Taiwan	Mandarin, English
	Jalel Chabchoub	Tunis	English, French, Arabic
	Hassan Ali Younes	United Arab Emirates	English
	Massam Abdel-Karin Abu Hijleh	United Arab Emirates	English
	Rajvant Nijjhar	UK	English
	Hilary Wood	UK	English
	Nataka White	USA	English
	Chris Balbach	USA	English
	Todd Amundson	USA	English
LEVEL 2	Javier Galván	Colombia	Spanish
	Someshwar Derashri	India	English
	Eun Jung Kim	South Korea	Korean
	Nick Keegan	UK	English

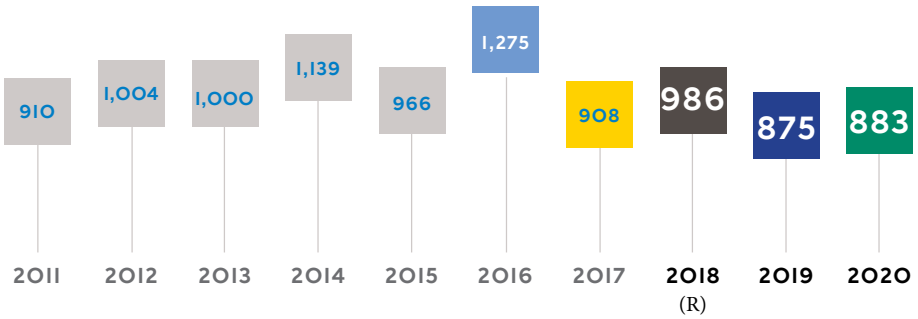
M&V FUNDAMENTALS AND THE INTERNATIONAL PERFORMANCE MEASUREMENT AND VERIFICATION PROTOCOL (IPMVP)®

For Energy Managers

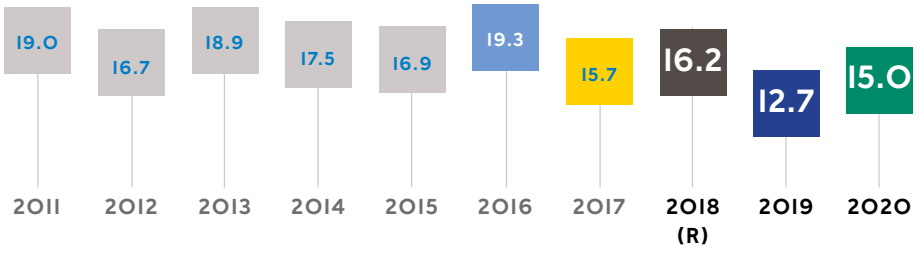
NUMBER OF SESSIONS



NUMBER OF PARTICIPANTS



PARTICIPANTS PER SESSION



OUR ORGANIZATIONAL SUPPORTERS

The knowledge that energy savings can be transparently reported is vital to the acceptance of energy efficiency proposals. EVO is the only organization dedicated to the provision of tools for this purpose. The IPMVP defines transparency in savings reports while assembling best practice from around the world.

By their contribution to our protocol development activities, our organizational supporters are shaping the future of M&V and helping governments, utilities, regulators and other stakeholders adopt sound policies and regulations. They also help the financial community and contracting parties to manage the risks associated with the financing of energy efficiency and water saving projects.

Becoming an EVO organizational supporter allows EVO to do its important work in the field of M&V. Through their support, EVO can continue to provide its publications free of charge to industry M&V professionals worldwide, ensuring that the information is available to all. Thanks to this support we are in a position to continue developing and improving M&V protocols and other related products and technical guides.

EVO's protocols have historically been provided for free to the M&V community because of the financial support received from various organizations. However, as a non-member-based, not-for-profit organization, EVO has limited financial resources to fulfill its widely recognized mission.

Seattle City Light

Bonneville Power Administration

BC Hydro Power smart

adene

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Organizational supporters' contributions go towards maintaining the actual portfolio of protocols and educational material. Most importantly, these contributions help design and deploy the next generation of M&V protocols that will continue to be offered for free to the international M&V community.

EVO-WORLD.ORG
EVO.CENTRAL@EVO-WORLD.ORG

DTANGUAY@EVO-WORLD.ORG

+1 202-738-4639

CORPORATE ADDRESS
1629 K STREET NW, SUITE 300
WASHINGTON, DC 20006, USA