Initiatives to promote M&V and energy services in Ireland

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Alan Ryan, Public Sector Programme Manager,
Sustainable Energy Authority of Ireland

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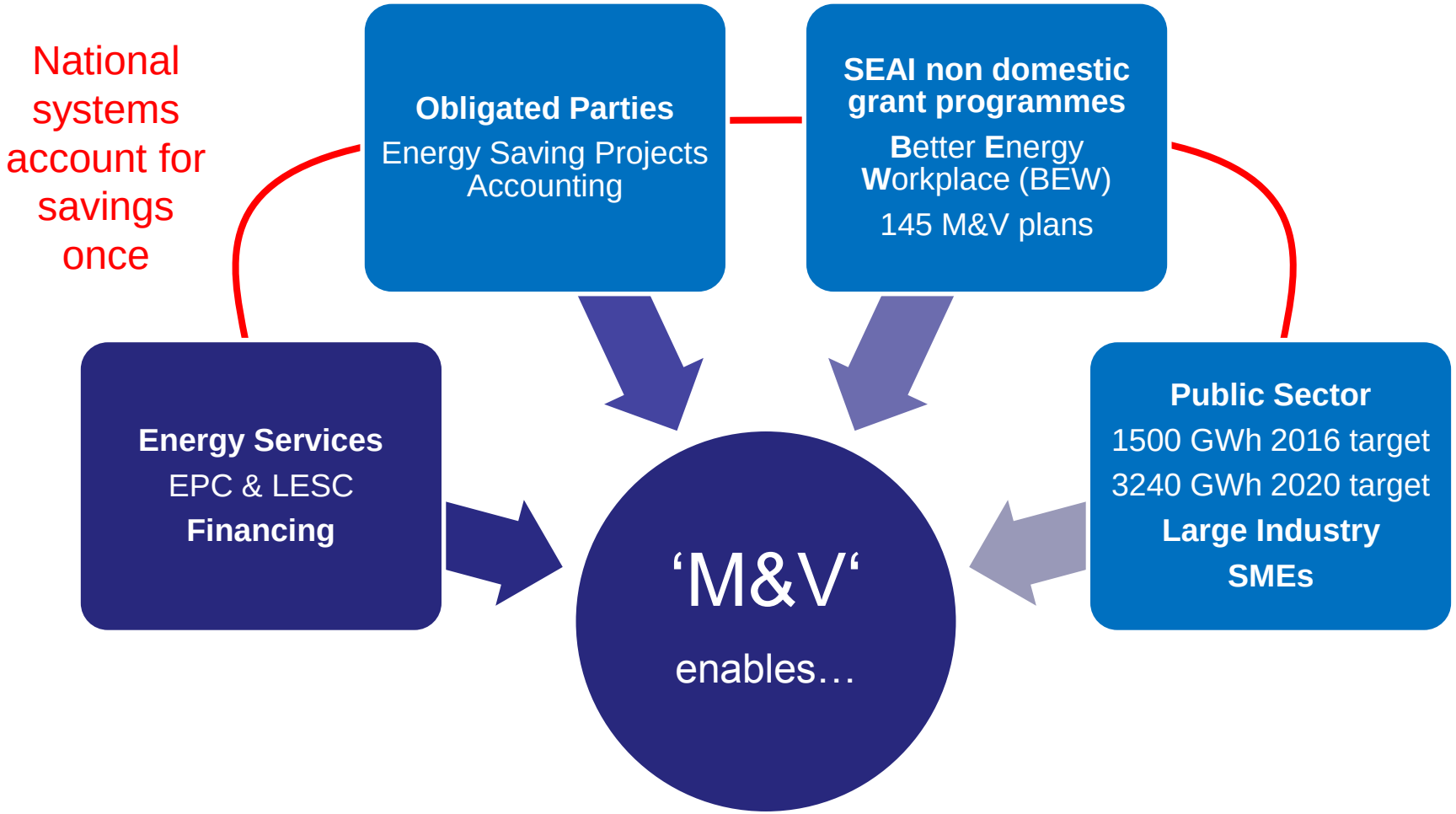
- M&V in context
- M&V examples
- Understanding what it is and isn't !
- Public sector requirements

M&V and the linkages across programmes



EPC – Energy Performance Contracting
LESC – Local Energy Supply Contracting

M&V story

- Pre 2011 – data a requirement of grant support
  - Only a few would provide data
  - Condition added – no data – grant must be re paid
- 2011 – first IPMVP course. 24 CMVPs
- 2012 grants. No M&V at application stage, no grant.
  - Guidance, national workshops
  - 2011 case studies (some IPMVP projects)
- 2012, some 3rd party training. 35+ CMVPs
- 2012 – EPC/LESC policy action group

Guide to EPC and performance guarantees

http://www.seai.ie/Your_Business/Public_Sector/Energy_Performance_Contacts_and_Guarantees.pdf

- Awareness
- Out to market for consultation

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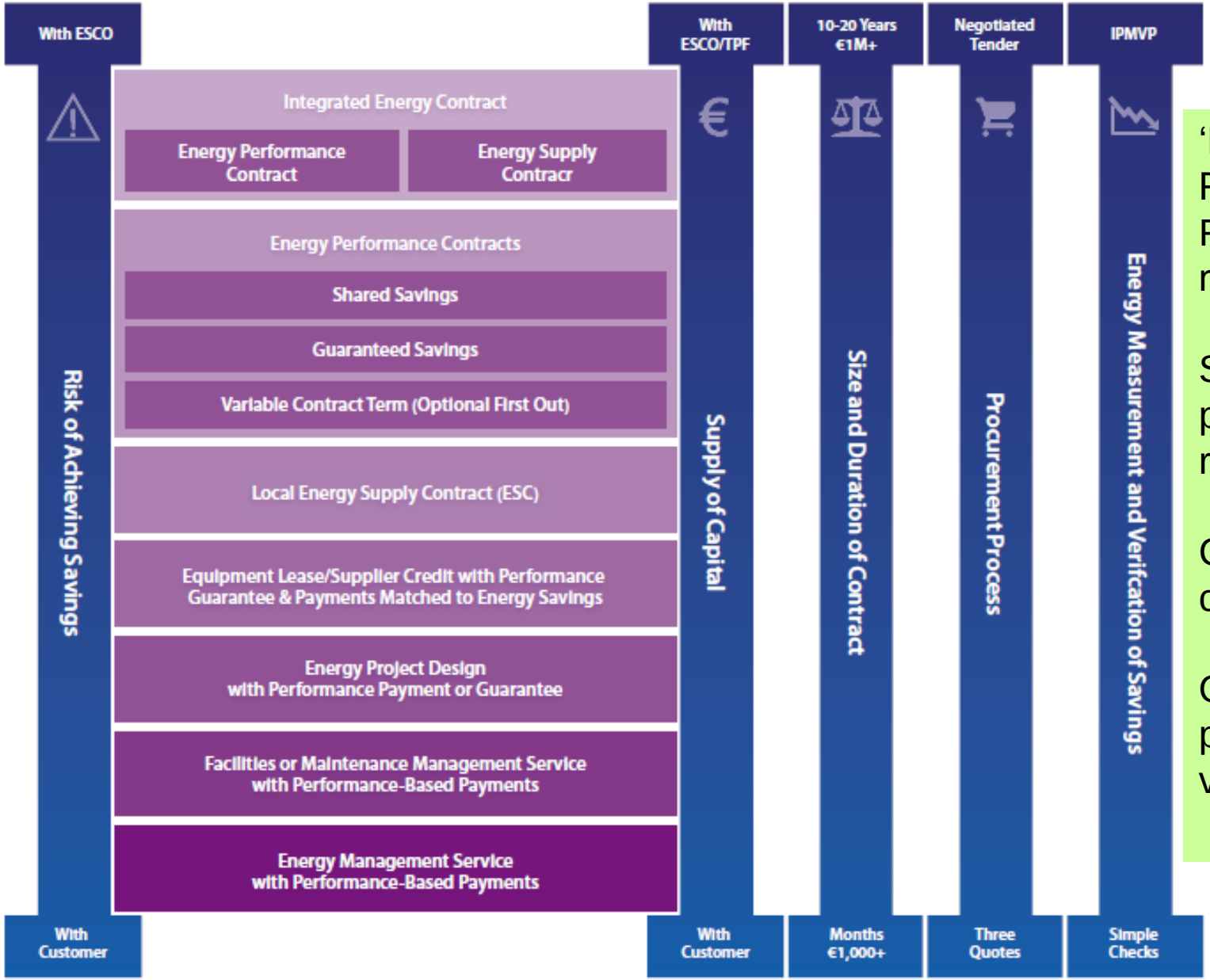
Energy Service Companies take Performance Risk



'Pay for Performance' – Financial risk for non 'performance'

Some sort of performance related clause

Can be simple or complex

One common principle, 4 variables

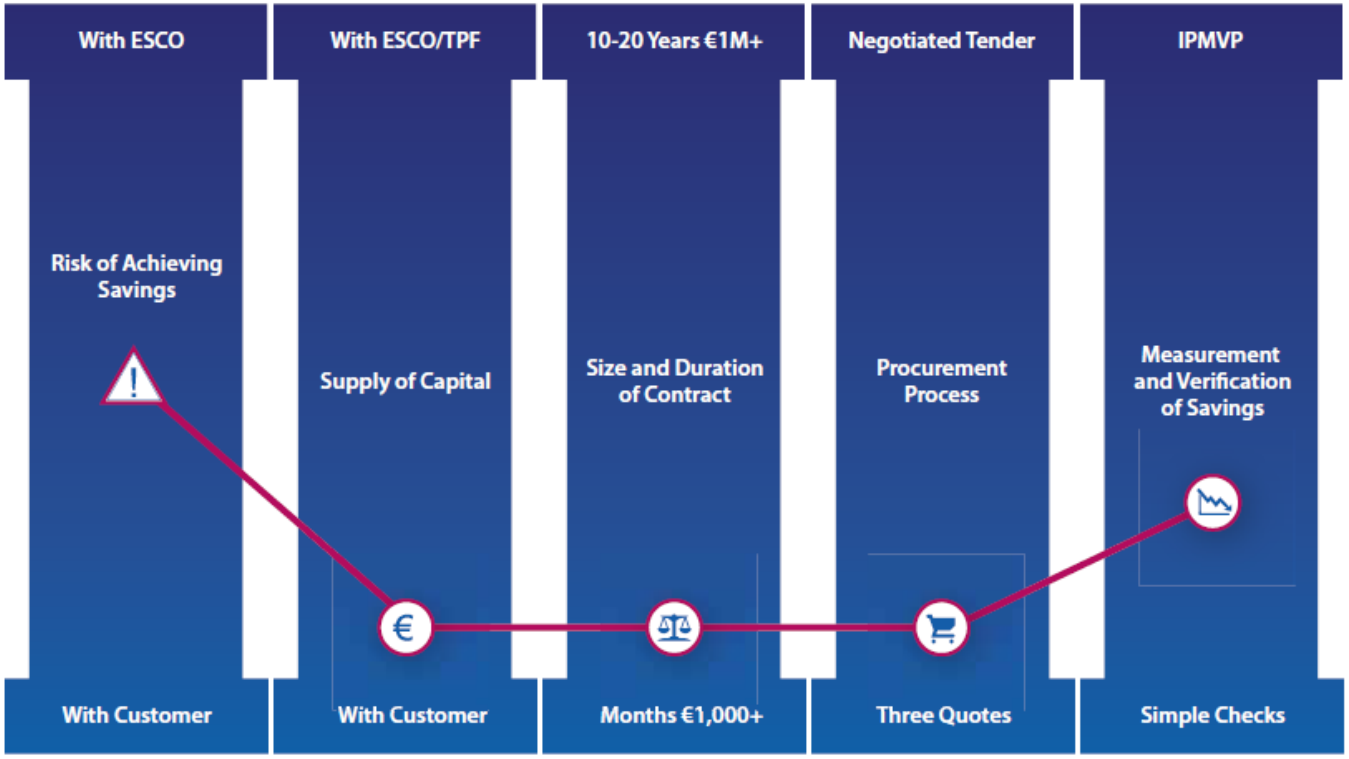
See Fig.3 overleaf for a more detailed description of Energy Services.'

2011 - Simple M&V

Case Study of Equipment Supply & Installation with Energy Performance Guarantee

Customer
44 poultry broiler sheds across 22 sites in six counties.

The reduction in lighting load was verified by measuring the power drawn by the lighting circuits before and after the installation. Lux levels were also measured before and after to



Energy performance guarantee

Simple before / after analysis

Easy to make IPMVP compliant

Savings €75,000 across 44 different sites

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ps

2011
More complex M&V

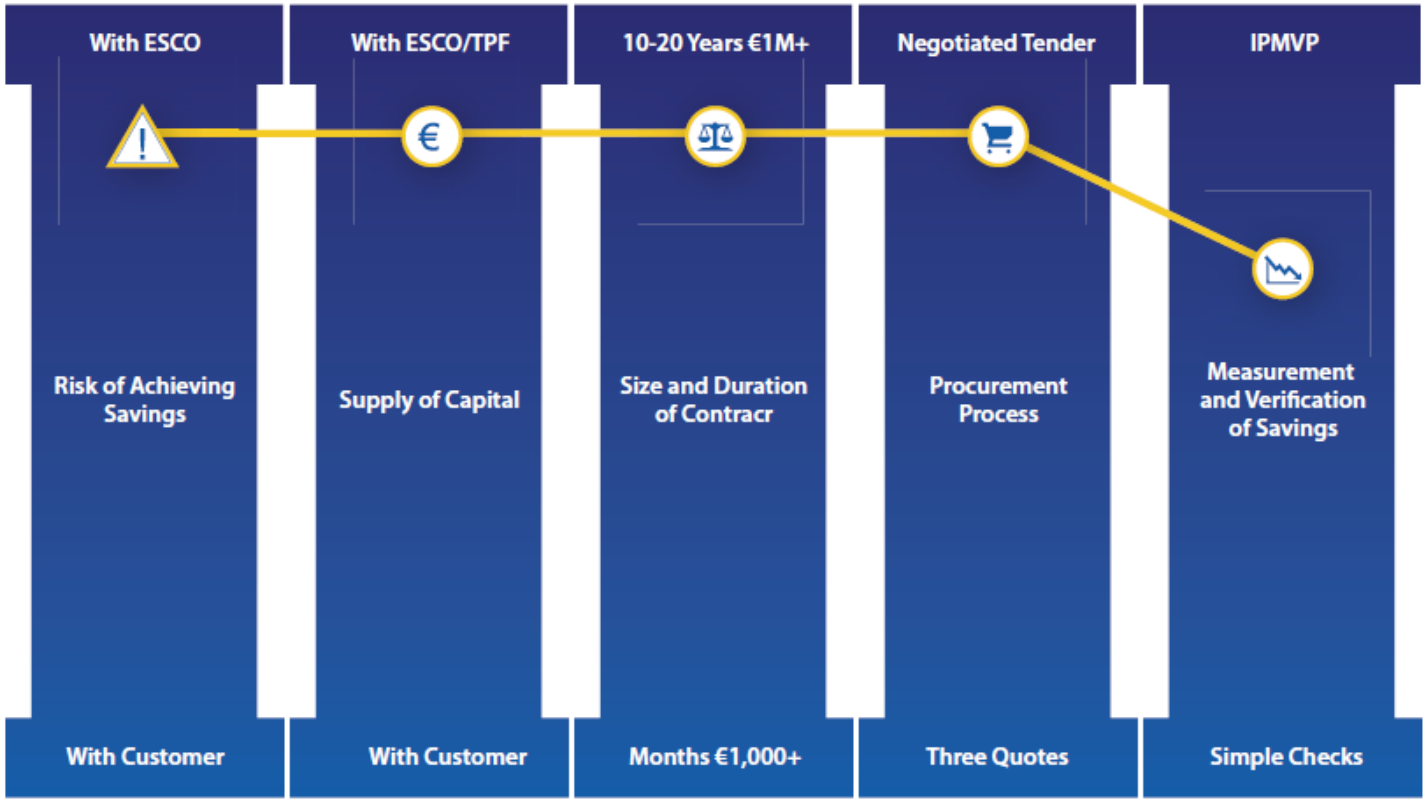
Case Study of Integrated Energy Contract with Shared Savings

Customer
Stewarts Hospital.

ESCO
Dalkia.

Measures

Benefits
New, reliable plant with no upfront capital cost. Energy savings, arising from supply side and demand side efficiencies, help offset monthly payment cost. Operational and maintenance risks transferred to contractor. Greenhouse gas reduction.



Full integrated ESCO contract

More robust M&V but not to IPMVP

Investment of €1.5m

Savings of €100,000 per annum

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With Customer | With Customer | Months €1,000+ | Three Quotes | Simple Checks

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2012
Move from some M&V to all M&V

Better Energy Workplaces (BEW) Measurement & Verification (M&V)

Guidance Note

Measurement and Verification (M&V) refers to the principle of assessing the actual energy saved from a particular project or group of projects. As a minimum it requires that some form of actual measurement is performed before and after the energy saving project(s) are undertaken. This is usually undertaken by an independent party but can be performed by the client or the service provider.

The M&V plan should list in more detail exactly how the M&V process will work for each sub-project or the project as a whole. The IPMVP details an internationally accepted methodology for preparing an M&V plan (see link below). A formal IPMVP compliant plan is not required; however the M&V plan needs to address the following at a minimum:

- What measurements will be undertaken before and after the project(s) are delivered. The names of particular permanent meters and temporary meters that will be used?
- If the measuring is to be done at the main utility meter points, how will variables that affect energy consumption be factored to ensure the impact of the energy saving project(s) can be properly assessed?
- What is the duration of measurements before and after? If sub metering, detail what circuit or particular equipment will be measured; the data to be collected, and at what frequency.
- Detail how the savings will arise. For example 10kW continuous reduction from changing from 40xlamp type A to 35 lamp type B, or reducing the speed of fan A from 100% to 50% for 30% of the time.
- What assumptions are been made, for example, run hours, on/off or other control parameters, production volumes, opening hours, BMS settings.. How will these variations be used?
- Method to be applied to verifying the savings, using the data gathered above – for example before / after total instantaneous load reduction (for non variable loads for example), before / after kWh reduction, statistical analysis, modelling etc (for variable loads)
- Reporting requirements and timelines for when reports are to be made available

For full details on IPMPV, register here to download the 2012 guide:

http://www.evo-world.org/index.php?option=com_content&view=article&id=786%3Aevor-announces-the-release-of-its-2012-ipmvpr&catid=1%3Arecent-news&Itemid=403&lang=en

- Evaluations take into account proposed M&V approach
- 145 grants offered in 2012 = 145 M&V plans, >30% comply with IPMVP, all of these have some sort of performance related clause
- Some energy suppliers doing M&V
- For large projects, 10% of payment retained for provision of M&V data in 2013

BEW 2011 project, 26 schools, 10 Vocational Educational Committees (VECs) IPMVP Option C

Baseline Period	CL-HO	LS-Abbeyleix	C-Colemans	C-Aidans	C-Brogans	C-Choilm	TS-Raheen	OY-Ncormac	OY-Oaklands	DL-Abbey	DL-Errigal	CN-StBricins	KE-ScoilMhuire
Total (kWh reported)	78,003	973	179	277	7,544	208	7,787	843	258	20,092	541	10,762	174
Count (of meter readings)	10	9	3	6	4	3	10	6	10	9	8	10	6
Average (usage in kWh per week)	7,800	108	60	46	1,886	69	779	141	26	2,232	68	1,076	29
Reported vs possible	*91%*	*82%*	*27%*	*55%*	*36%*	*27%*	*91%*	*55%*	*91%*	*82%*	*73%*	*91%*	*55%*
Total	233,810	2,588	1,544	564	27,381	2,117	20,792	2,082	1,253	72,335	1,886	7,800	227
Reporting Period													
No. of weeks reported:Count	30	27	28	31	31	30	32	23	30	31	27	17	8
Average	7,794	96	55	18	883	71	650	91	42	2,333	70	459	28
Saving	7	12	5	28	1,003	- 1	129	50	- 16	- 101	- 2	617	1
Saving as percentage	0%	11%	8%	61%	53%	-2%	17%	36%	-62%	-5%	-3%	57%	2%
Reported vs possible readings	*100%*	*90%*	*93%*	*103%*	*103%*	*100%*	*107%*	*77%*	*100%*	*103%*	*90%*	*57%*	*27%*

- 26 schools grouped together to maximise design and procurement savings
- Each school completed an energy data sheet each week
- IPMVP Option C used for each school. No EPC. IPMVP chosen so as to evaluate savings for the sponsoring bodies. Demonstrates EPC for schools possible.

:

- 11 weeks readings for baseline, approx. 69% were received
- 42 weeks in total i.e. from August'11 to May'12, 65% were received

Electricity Usages

- Total reported usage before (baseline) = 405,461 kWh / 11 wks = 40,546kWh / wk
- Total reported usage after (reporting period) = 738,383kWh / 31wks = 24,613kWh / wk

<u>This is a saving of 39%</u>, albeit for electricity only. Final report will issue in Nov'12

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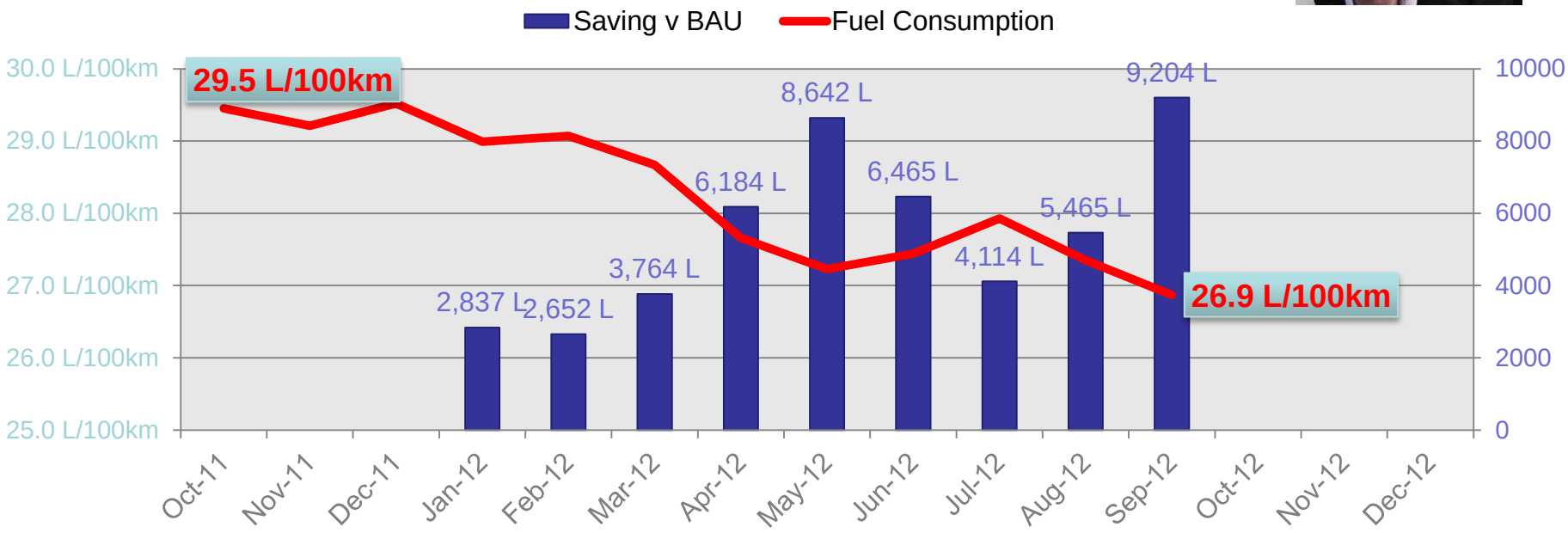
First transport project internationally compliant with IPMVP ?

- Confidence from M&V process allowed
  - Daily & weekly driver feedback
  - Jan-Sep'12 further 10% saving



In 2012

- Dublin Port
  - BMS, boilers, air conditioning, public lighting
  - Mixture of Option C for the facility and Option B for the public lighting
- Coilte (national forestry company)
  - Approx 200 of 400 fleet, all private drivers
  - Coilte buy telematics and coordinate eco driving training
  - Drivers pay Coilte on basis of M&V'd energy savings

M&V debate – how accurate should it be

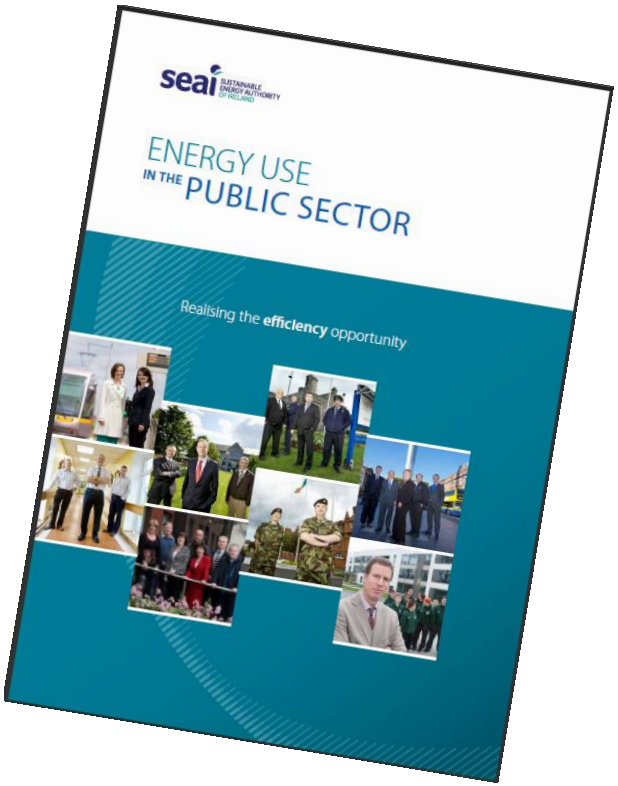
- Measurement and Verification (M&V):

  *The process of using measurements to **reliably determine actual savings** created within an individual facility by an energy management program. **Savings cannot be directly measured**, since they represent the **absence of energy use**. Instead savings are determined by **comparing measured use before and after implementation of a project**, making appropriate adjustments for changes in conditions.*

  - EVO IPMVP 2010

The public sector – 2010 data

- €700m+ energy spend
- Two targets
  - Top down - 33% organisational energy efficiency improvement
  - Bottom up - Avoided energy usage savings
    - 1500 GWh by 2016
    - 3240 GWh by 2020



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Policy and legal obligations

NATIONAL ENERGY EFFICIENCY ACTION PLAN (NEEAP)

- 33% energy efficiency improvement by 2020
- 3,240 GWh savings by 2020
- 'Lead by example'

S.I. 542 OF 2009 (ENERGY END-USE EFFICIENCY AND ENERGY SERVICES)

- 1,500 GWh saving
- Exemplar ro
- Must c
- A

…iting)
…A3 (from 2015)

S.I. 151 OF 2011 (ENERGY EFFICIENT PUBLIC PROCURE

…d vehicles from the Triple E register

…splay Energy Certificates required in public buildings >1,000m²

> 500m2 from January 2013, S.I 243 of 2012

…(GREEN …UREMENT)

- Better procurement of energy supplies, energy efficiency and renewable energy services, energy using products and energy using capital projects

To come

NEEAP 2

Energy Services Directive

- 3% retrofit target per year for 'central government'

SEAI supports

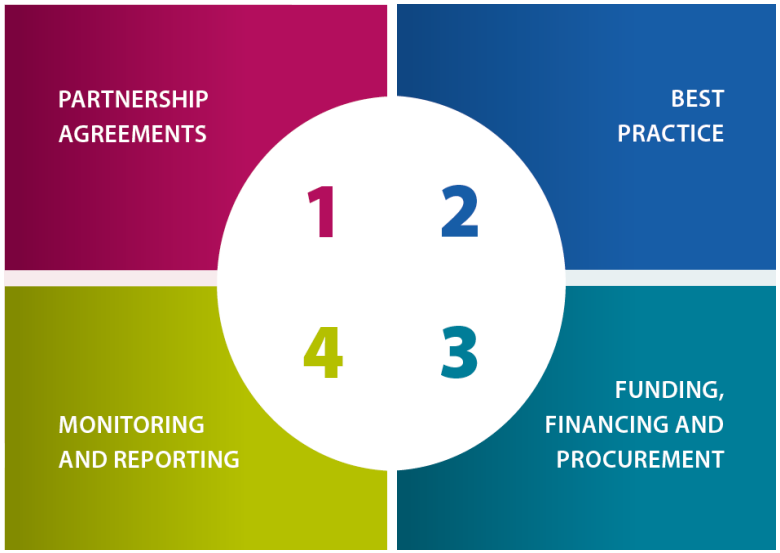
Top 150 PBs focus

30 signed up

Energy Management

Networking ‘EnergyLink’

Commitment



Guides Assessments Studies

Organisation Performance

Funding = Grants

Project / facility Performance

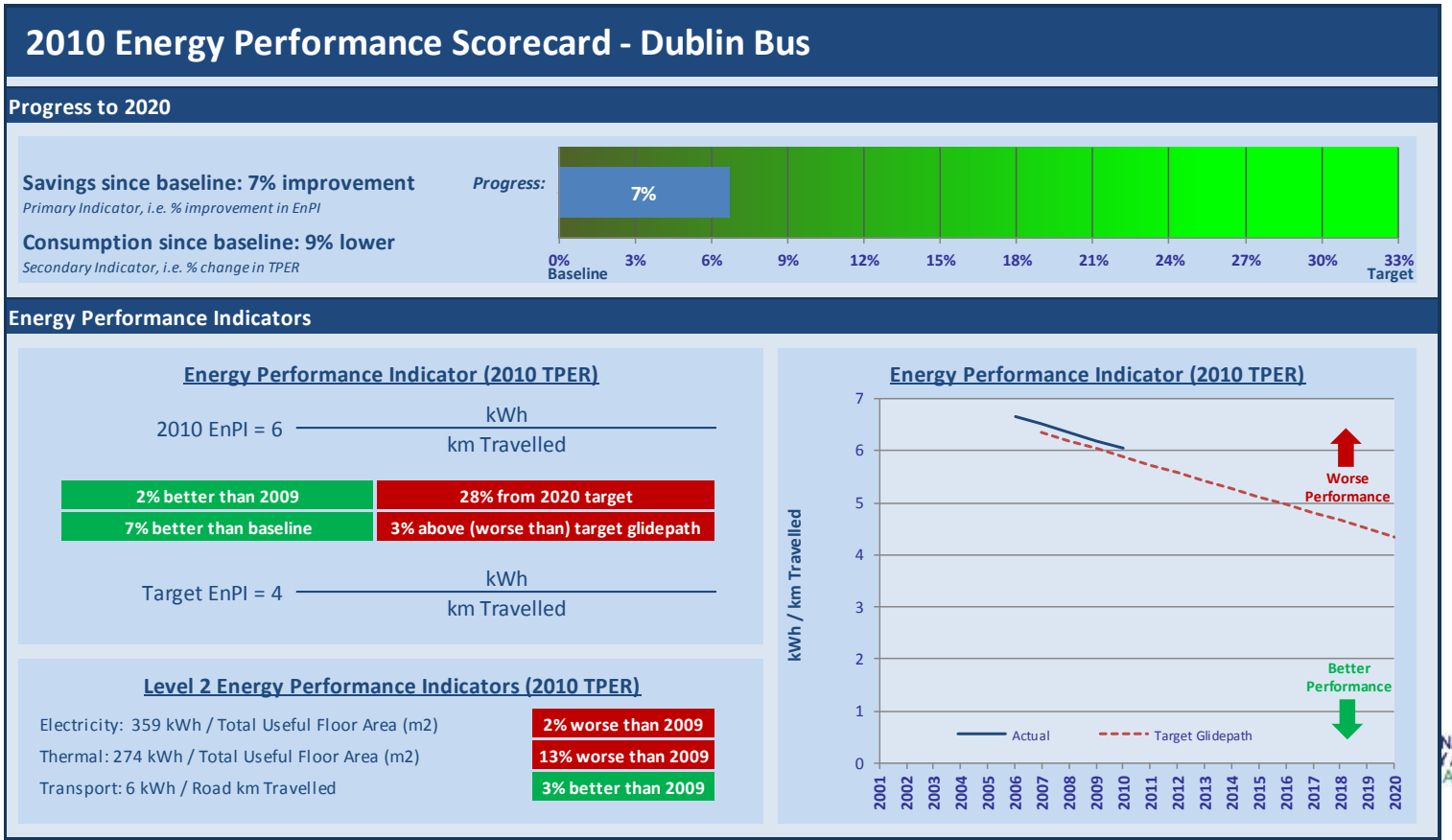
Online, 30,000 meters

GPP Triple E Training

Financing = ESCOs

Public Sector Monitoring and Reporting 33% perspective Dublin Bus

- To track each organisation against
  - Organisations progress towards the 33% target
  - Energy saving projects



Summary

- M&V done for a reason, mostly related to energy performance clauses
- M&V and IPMVP can be applied to non standard, non typical applications
- Doesn’t have to be complicated
- Good practice

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alan.ryan@seai.ie