



Overview of impact of EnMS in emerging economies and developing countries, including companies examples



Marco Matteini
Industrial Energy Efficiency Division
Department of Energy

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Content

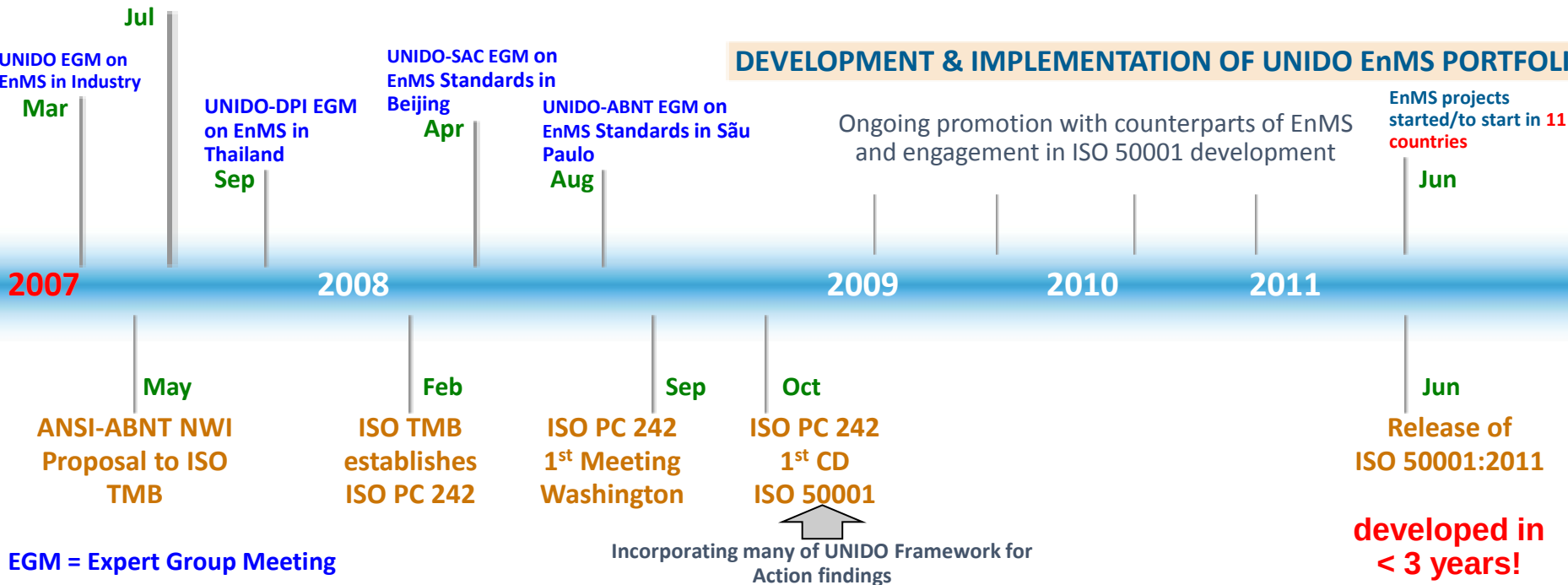
1. UNIDO and Energy Management Systems (EnMS)-ISO 50001
2. Promoting and supporting EnMS-ISO 50001 in developing and emerging economies
3. What EnMS can achieve
 - i. Company level
 - ii. Programme level
4. Scaling-up EnMS deployment
5. Synergies of EnMS maturity process and digitalization



UNIDO's EnMS-ISO 50001 journey

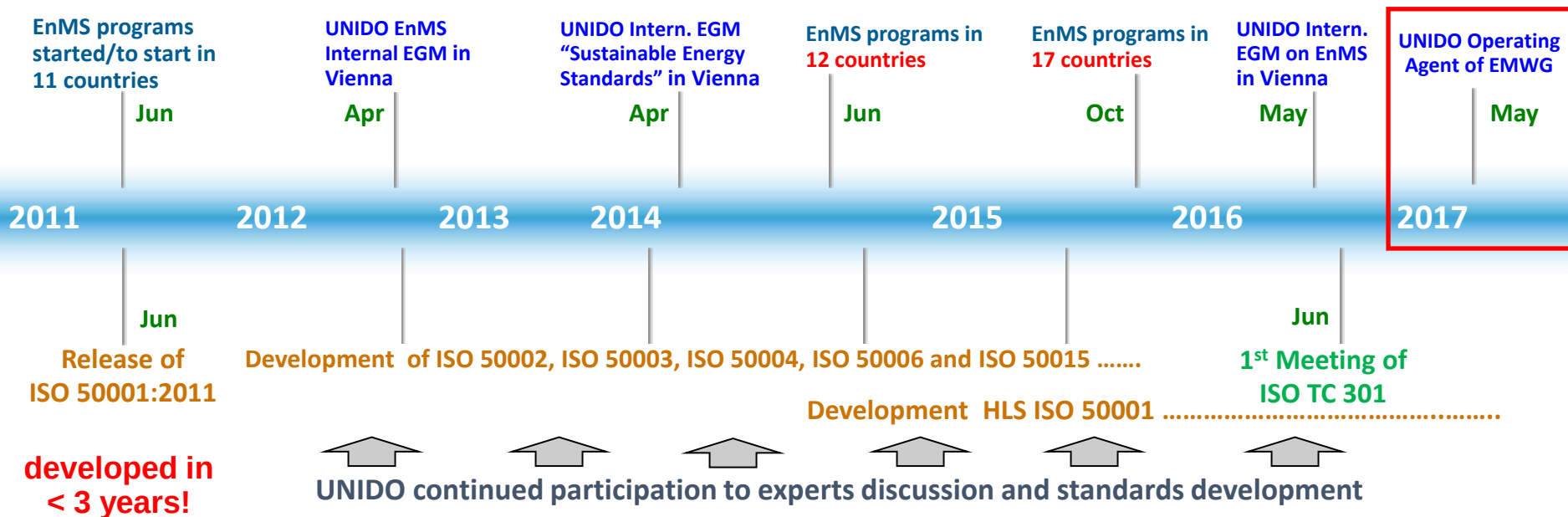
Launch of UNIDO Project on promotion
of international EnMS standards

DEVELOPMENT & IMPLEMENTATION OF UNIDO EnMS PORTFOLIO



UNIDO's EnMS-ISO 50001 journey

DEVELOPMENT & IMPLEMENTATION OF UNIDO EnMS PORTFOLIO



developed in
< 3 years!



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

UNIDO Global EnMS-ESO Programme – June 2017

Operational in 18 countries

Planned activities in 10+ countries



Projects ongoing

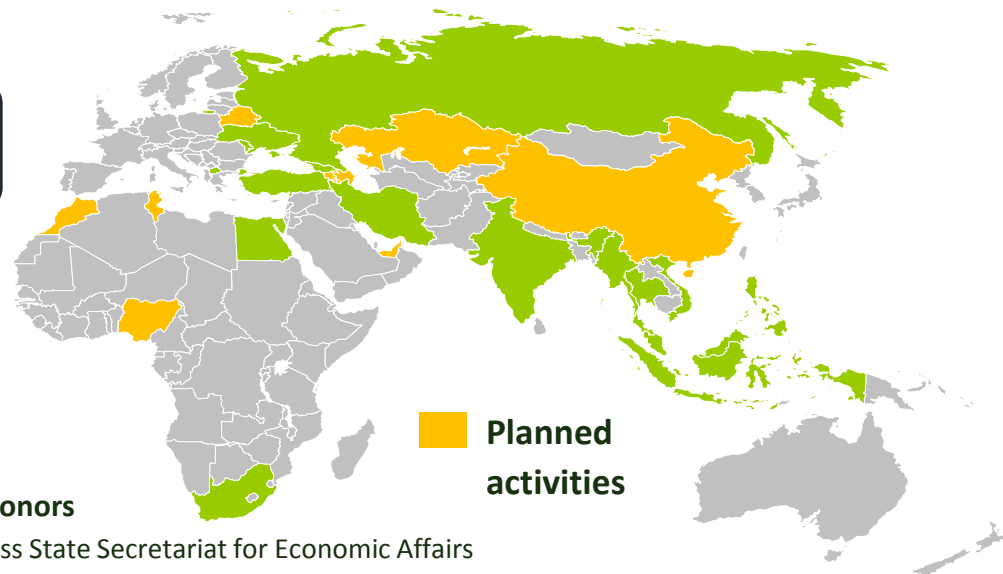
South Africa	Indonesia
Moldova	Egypt
Russia	Iran
Turkey	Ukraine
Ecuador	Colombia
Malaysia	Macedonia
Thailand	Myanmar
Viet Nam	India
Philippines	Georgia

Other donors

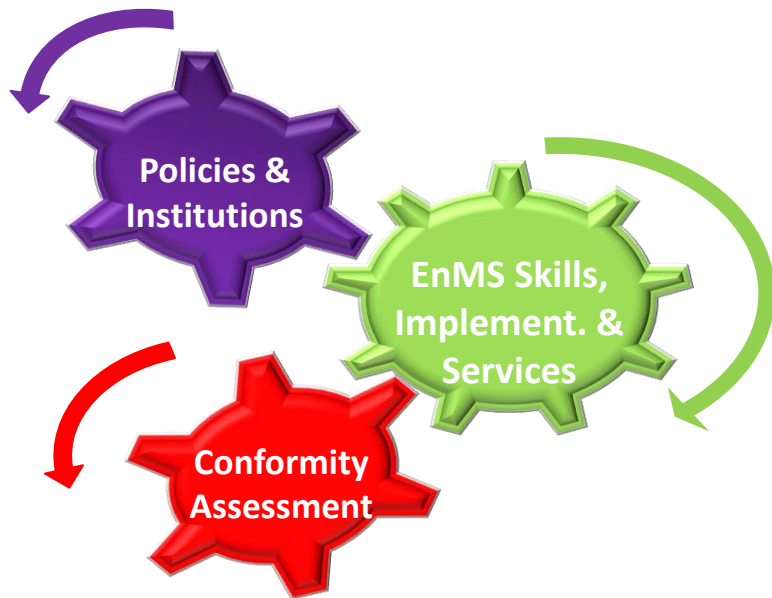
- ✓ Swiss State Secretariat for Economic Affairs
- ✓ UK Department for International Development
- ✓ Government of South Africa
- ✓ Government of Italy
- ✓ Government of Austria



Planned activities



Success Factors for EnMS-ISO 50001 Deployment

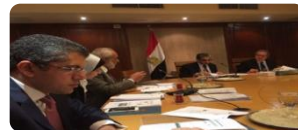


- ✓ Level and quality of policy support, including regulation, for promotion & implementation of EnMS/ISO50001
- +
- ✓ Availability of competent EnMS workforce on the “Supply” and the “Demand” sides
- +
- ✓ Credible demonstration to organizations and the market of EnMS/ISO50001 tangible benefits

Typical UNIDO IEE-EnMS Project Structure

Policy Support

- Programmatic framework to promote industrial energy efficiency (IEE) and EnMS-ISO50001
- Nationally tailored IEE institutional strengthening



IEE Market Development

- National campaign to promote IEE & EnMS-ISO50001
- 20+ EnMS & 30+ ESO national experts qualified
- 50-100+ enterprises receive training on EnMS & ESO



Implementation in Industry

- 15+ large companies (or SMEs) implement EnMS
- 30+ low cost EnMS-ESO projects are implemented
- XYZ GWh of energy & XX,000 tons of CO2eq saved



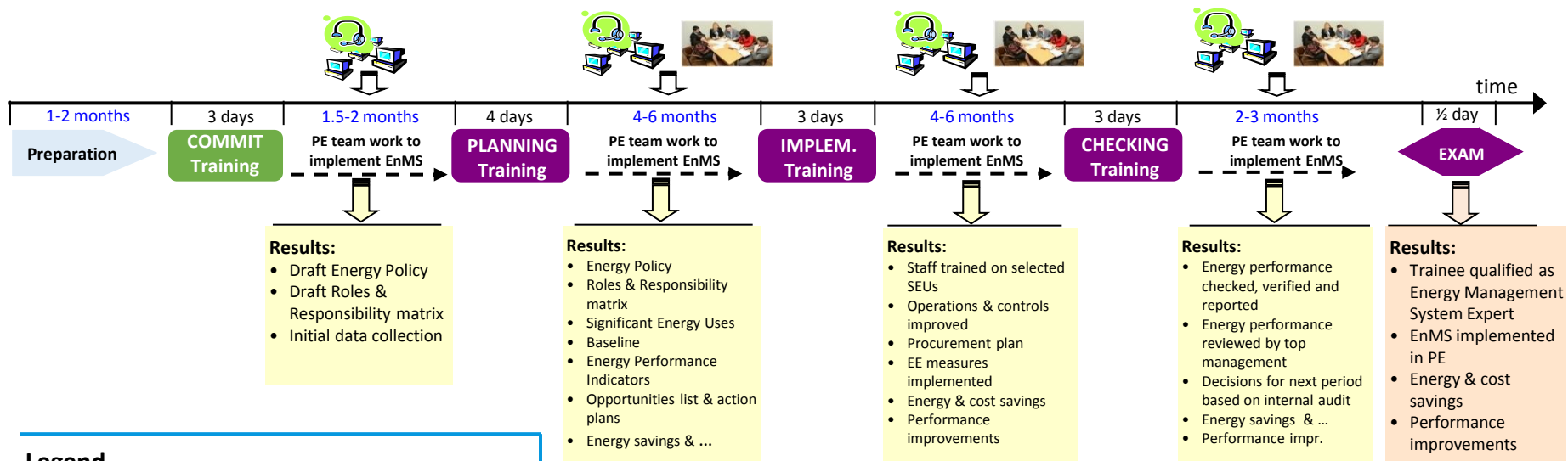
Investments in IEE BAT

- Mechanisms to enhance mobilization of country's available financing for IEE-LC BAT investments
- Capacity building of banking sector on IEE investments



Combining Skills Development and Results

The UNIDO EnMS Capacity Building and Implementation Programme



Legend

PE team

A Partner Enterprise (PE) team is formed by the PE's staff participating in the EXPERT program plus 1-2 national consultants/trainees.

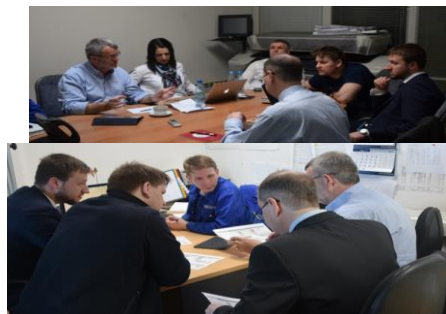


Ongoing and periodic communication through webinars, emails and phone calls between international trainers and PE teams to review progress, discuss issues and provide guidance.



Plant visits by national EE consultants/trainees

Example 2 : Brewery – Russian Federation



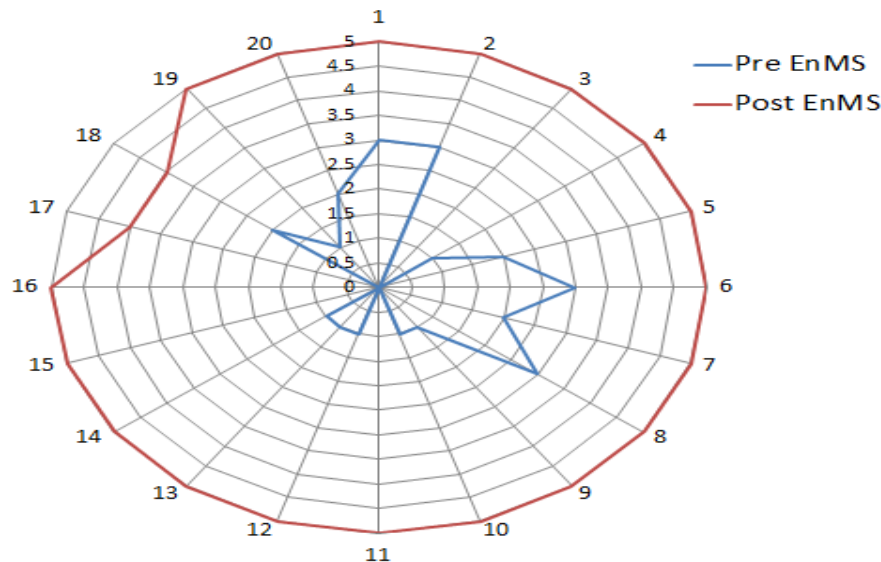
Savings in million Rubles from Sep 2014 to Feb 2015 achieved without investments!

	Plant 1	Plant 2	Plant 3	Plant 4	Plant 5	Plant 6	Plant 7	Plant 8	Sub-Total
Water	-1,7	-0,8	-0,4	-1,1	-1,2	-0,1	-0,8	-0,1	-6,2
Electricity	-0,8	-2,2	-4,7	-3,2	0,4	-1,7	-2,2	0,7	-13,6
Heat	0,0	-0,2	0,0	-2,0	3,0	-5,3	-1,4	1,7	-4,3
Total (RUB)	-2,6	-3,1	-5,2	-6,3	2,3	-7,2	-4,4	2,3	-24,1

Example 3 : Refractory Material – Macedonia

Vardar Dolomit

- ✓ Production of fire resistant materials based on sintered dolomite
- ✓ 85 employees
- ✓ 29.3 GWh 2015 consumption of oil & mazut
- ✓ 3.3 GWh 2015 consumption of electricity
- 19,655 € from electricity savings (7.5%), normalized
- 70,000 € from power purchase contract savings, due to better electricity demand control and forecasting
- In 2017, added oil & mazut to EnMS scope
- **174 MWh** of normalized energy savings in first 4 months of 2017 with NO investments



Improvement of Energy Management Practices

2016 Electricity Savings Nor. (MWh)	248
2016 GHG Reductions (tons CO ₂)	320.7

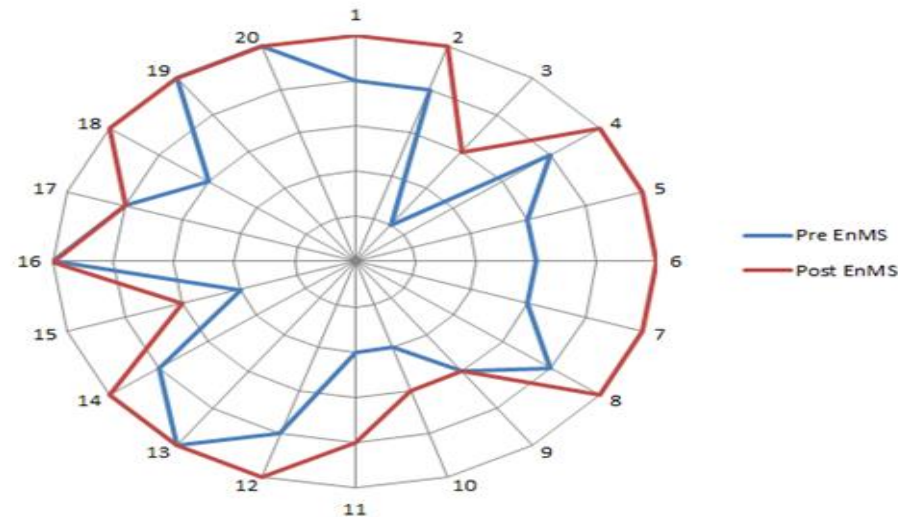
Example 4 : Power Generation – Macedonia

REK BITOLA

- ✓ Mining and Energy Combine (REK) Bitola meets over 70% of country's demand for electricity
- ✓ Coal-lignite thermal power plant, total installed generating capacity of 700 MW and annual generation of 4,000 GWh
- ✓ Production in 2016 was 2,685 GWh; own consumption was 286.2 GWh
- ✓ In 2016, EnMS limited to power generation facilities
- In 2017, EnMS extended to incl. mining operations
- **8,700 MWh** normalized savings as of 7 Oct 2017
- EnMS implementation being replicated in all branches of ELEM, the national largest power utility

2.97% of total consumption

Payback time: 22-24 days



Improvement of Energy Management Practices

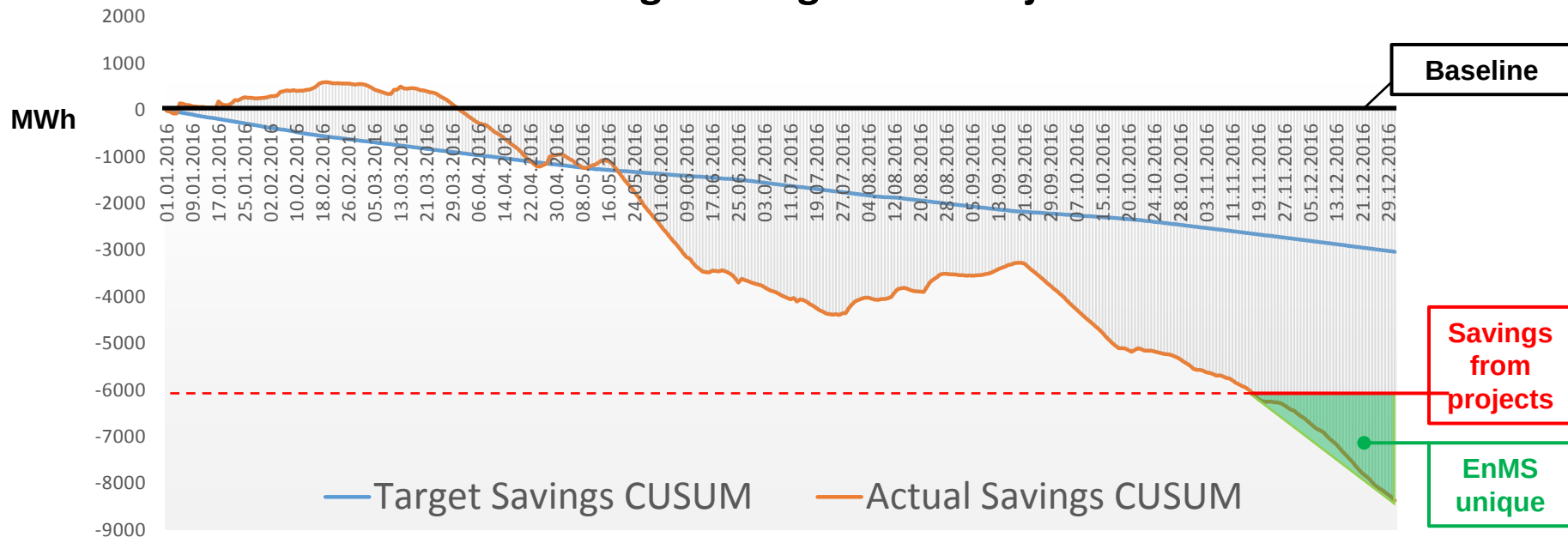
2016 Energy Savings Norm. (MWh)	8,502
2016 GHG Reductions (tons CO ₂)	10,528



Example 4 : Power Generation – Macedonia

REK BITOLA

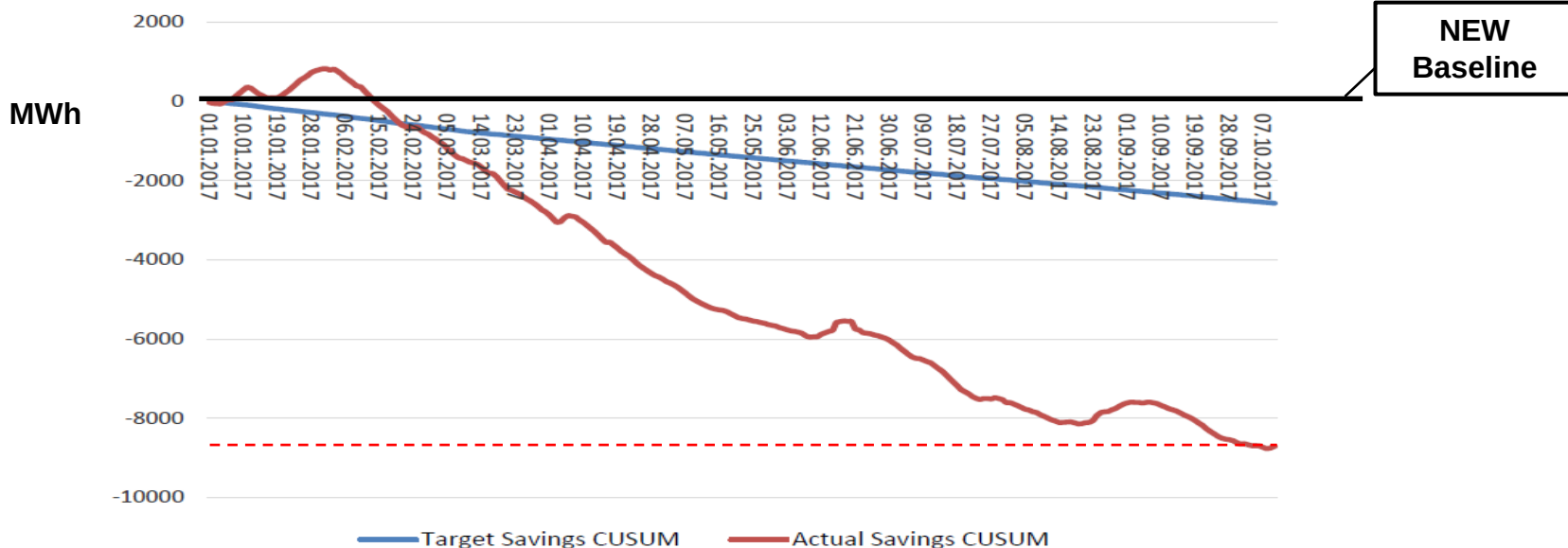
Actual savings vs Target & vs Projects - 2016



Example 4 : Power Generation – Macedonia

REK BITOLA

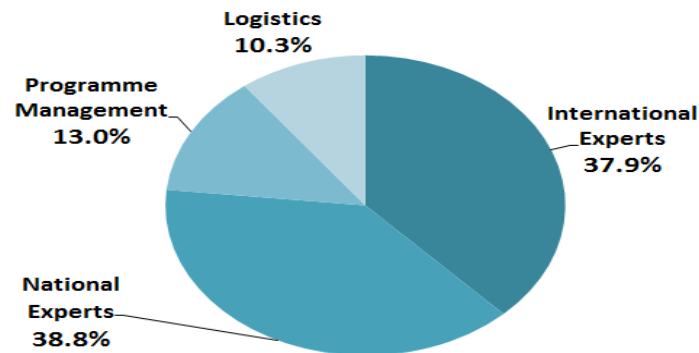
Actual vs Targeted Energy Savings - 2017



EnMS Capacity Building and Implementation Program

Costs and Benefits Analysis - FYR of Macedonia

- 12 Partner enterprises (70% success rate)
- 23 Nat. Consultants/Expert Trainees
- Full cost/value of Nat. Consultants
- Include Progr. develop. and implementation
- No inclusion of UNIDO staff & support costs
- Energy Savings 1 Yr: 13.19 GWh (67% no cost)
- Energy Savings 5 Yr: 165 GWh
- **Money savings 1 Yr: 862,700 USD (55% no cost)**
- **Money savings 5 Yr: 10,792,000 USD**
- **Without considering non-energy benefits!**



UNIDO Implementation Category	COST [USD]
International Experts	110,000
National Experts	112,700
EnMS CBI Programme Management	37,800
Logistics	30,000
TOTAL	290,500

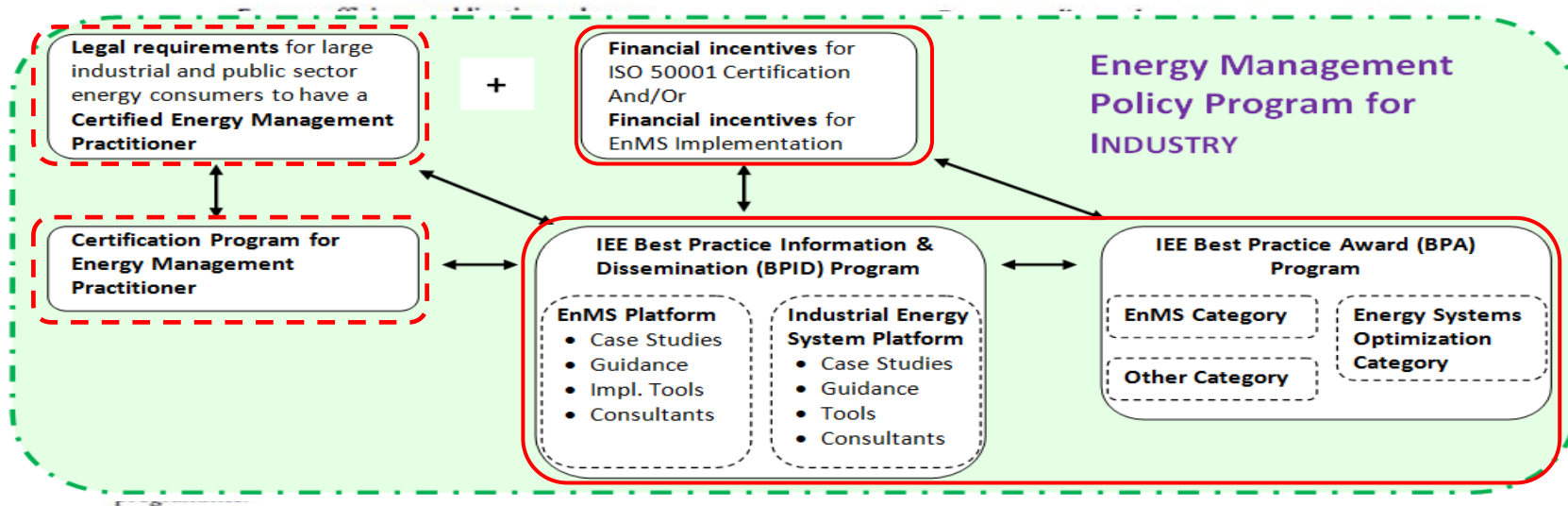
Scaling-up – Policy Programs FYR of Macedonia



EU Energy Efficiency Directive – Article 7 & Article 8

Article 7

Article 8



Scaling-up – Utility Programs

FYR of Macedonia

- Partnership UNIDO IEE Project and EVN Macedonia (Power Utility)
- 6+2 new companies implementing EnMS, including EVN Macedonia
- 6 UNIDO Qualified National EnMS Experts
- 7 new EnMS Expert Trainees, 2 from EVN Macedonia
- Cost-sharing of Qualified National EnMS Experts
 - 1/3 UNIDO project; 1/3 EVN Macedonia; 1/3 Beneficiary company
- 75% National Trainers – 25% International Trainers
- EVN Macedonia's Goals → Start providing EnMS-EE Services to Clients

Estimated (Replication) Cost to UNIDO ~ 10% of Pilot Program (i.e. <30,000 USD)

Scaling-up – Corporate Programs

Ural Mining and Metallurgical Company (UMMC Holding)

9 companies in EnMS Program in 2015

1. AK Serov Metallurgical Plant
2. Coal Mining Company “Kuzbassrazrezugol” (Kedrovsky Open Surface Mine)
3. Branch Of “Ummc-steel” - Electrostal Tyumen Metallurgical Plant
4. Joint Venture Company “Katur-invest”
5. Kirov Non-ferrous Metals Processing Plant
6. Revda Non-ferrous Metals Processing Works
7. "UMMC-Agro" - Teplichnoe
8. Shadrinsky Automobile Units Plant
9. Sukhoi Log Secondary Non-ferrous Metals Plant

Costs of energy resources in 2015 > **17 billion rubles**;

Energy resources account for **11.6%** in production costs;

Due to tariff increase, energy costs expected to account for **21,5 billion rubles in 2018**.

Energy consumption:	1054.3 GWh of Electricity
(9 companies) :	269.1 thou. m3 of Natural Gas

2015 Final Energy savings: 78.1 GWh (7.3%)

2015 Cost savings: 86.4 mln. rub.

2015 GHG emissions avoided: 32 361 tons CO2



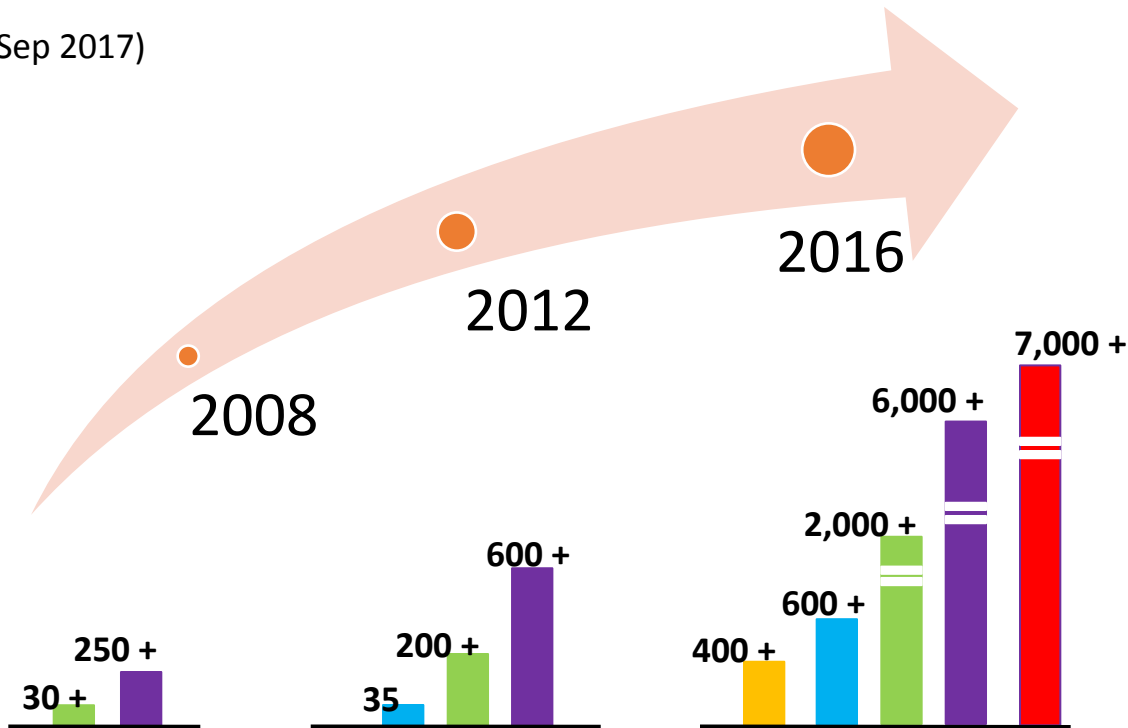
EnMS implemented in 10 new companies in 2016-2017.
UMMC holding counts more than 70 companies.

UNIDO-GEF Global EnMS-ISO 50001 Programme

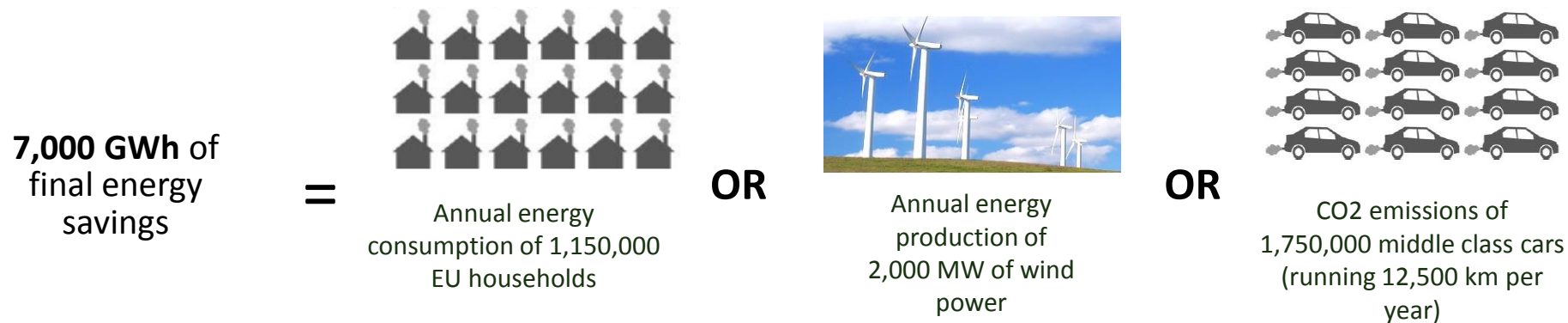
➤ Operational in 18 countries (as of Sep 2017)

- 12 Countries at the end of 2012

- Decision-makers reached
- Enterprises trained in EnMS
- Consultants trained in EnMS
- Enterprises with EnMS
- Cumulative direct final energy savings (GWh)



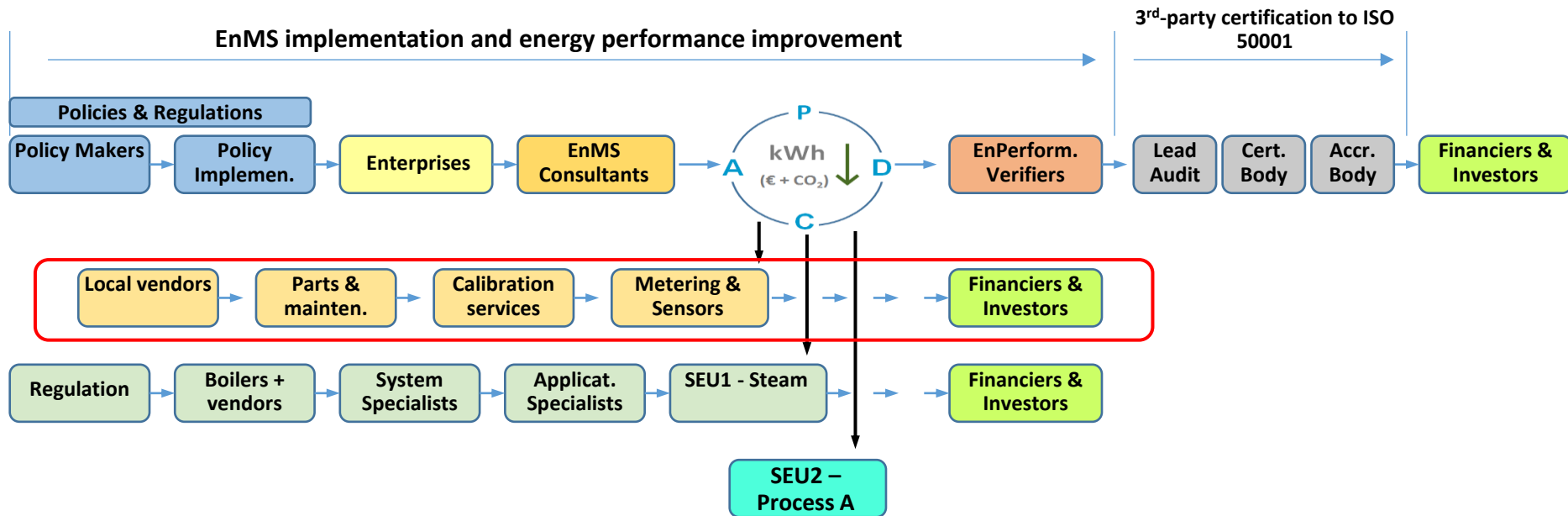
Impact of UNIDO-GEF EnMS-ISO 50001 Programme



- Organization-wide energy savings in first 1-2 years range from 4% to 15%, with little or no capital investments
- Annual cost savings of beneficiaries companies in 2015 exceeded **USD 100 mio** without considering non-energy benefits
- Direct GHG emission reductions of more than **4.3 million tCO2**
- Sustainable pipeline of IEE investments generated

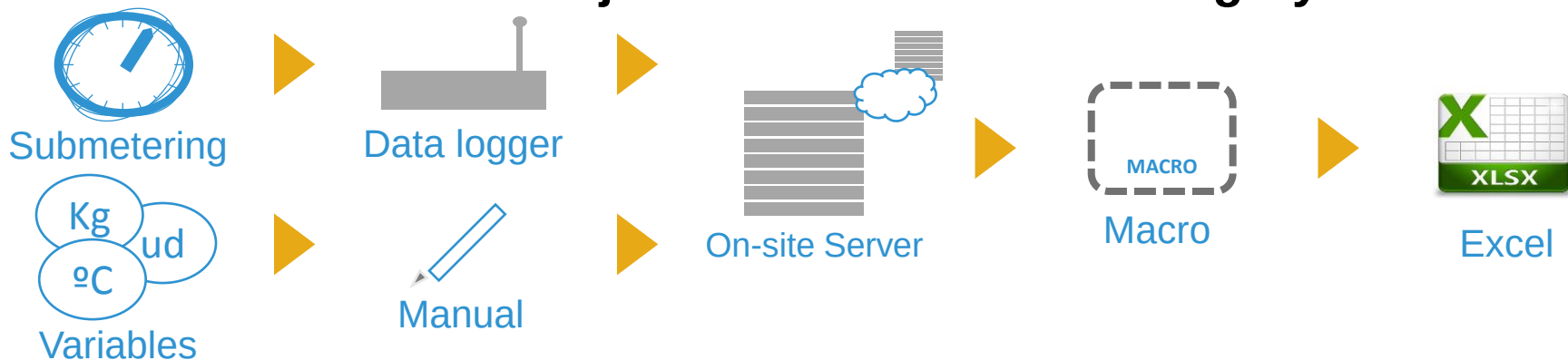
Maturity Process of EnMS-ISO50001 & Digitalization

Supply and value chain for EnMS-ISO 50001 and IEE



Digitalization, Analytics and IoT for EnMS and IEE

Moldova Pilot Project – JLC EnPI Monitoring System



OBJECTIVE:

- Monitor Energy Performance Indicators (EnPIs) of each SEU on a daily basis
- Automate energy/water consumption data collection & EnPIs calculation

AUTOMATION:

- Medium.
- Automated energy/water consumption data collection
- Manual data collection for relevant variables

SCOPE:

- 10 electricity meters + 2 gas meters + 2 water meters



THANK YOU!

For more information:

Mr. Marco MATTEINI

Industrial Development Officer

E-mail: M.Matteini@unido.org

Industrial Energy Efficiency Division

Department of Energy

UNIDO