Creating a Standard Framework for Sustainable Industrial Energy Efficiency

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Industrial System

- Globally, motor-driven systems consume more ten 70% of global manufacturing electricity (2194 billion kWh annually)
- It offers one of the largest opportunities for energy saving.

System Saving Opportunity

- Both markets and policymakers tend to focus on motor system components, which typically offers 2-5% efficiency improvement potential
- But the optimization of motor systems offers 20-50% efficiency improvement potential
- Similar savings opportunities also exists for steam systems

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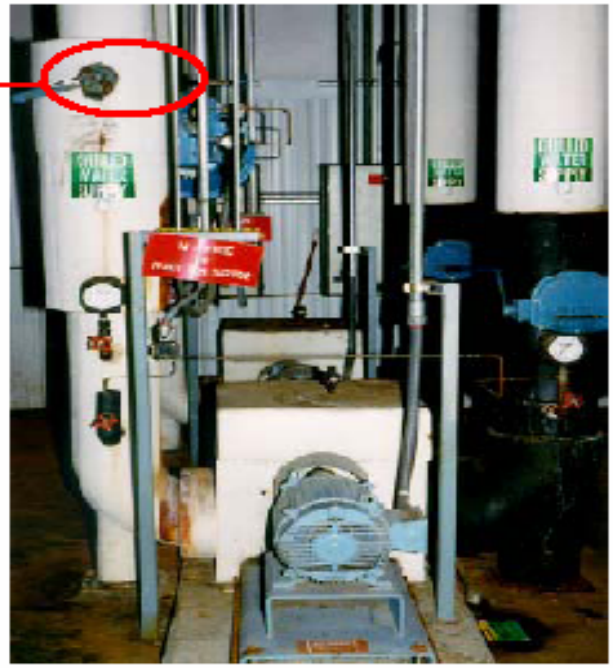
Pumping Systems
(Motor + Pump + Valve)

More than 40 psig drop across the throttle valve



Package efficiency =
Hydraulic output / Motor input =
2.7 / 14.9 = 0.18, or 18%

System Optimisation

- Evaluating work requirement and matching system supply to these requirements
- Eliminating or reconfiguring inefficient uses and practices (Throttling, open blowing, etc.)
- Changing out or supplementing existing equipment (motors funs, pumps, compressors) to better match work requirements and increase operating efficiency
- Applying control strategies and variable speed drives that allow greater flexibility to match supply with demand
- Identifying and correcting maintenance problems
- Upgrading ongoing maintenance practices

Characteristics of UNIDO approach

- Cross-cutting, not specific to particular sectors or industrial processes, but applicable over entire industry sector
- Focus on the transfer of knowledge and skill trough training. Developing capability to analyse industrial energy systems rather than offering “Ready made solutions”

Results of training in China

- 22 engineers trained in System Optimization techniques
- Within **2 years** after completing training these experts conducted 38 industrial plant assessments and identifies nearly **40 million kWh in energy savings.**

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Energy savings

System /facility	Total Cost $US	Energy savings kWh/y	Payback Period
Compressed air/forge plant	18,600	150,000	1.5 years
Compressed Air/machinery	32,400	310,800	1.3 years
Compressed air/tobacco	23,900	150,000	2 years
Pump system/ hospital	18,600	77,000	2 years
Pump system/pharma-ceuticals	150,000	1.05M	1.8 years
Motor systems/ petrochemicals	393,000	14.1M	0.5 years

Why industrial system are not more energy efficient?

- Industrial market focus on components, not systems
- Factories are primarily concerned with production, not energy efficiency
- Most industries have a budgetary disconnect between capital projects (equipment purchase) and operating expenses (energy and maintenance)

Why industrial system are not more energy efficient?

- Technical skill is required to optimise motor driven systems: as one size fits all approach misses most of the savings
- System optimization knowledge resides with the individual who has been trained. It is not institutionalized. It leaves with them when they leave or transfer
- Processes change over time and inefficiencies can re-occur

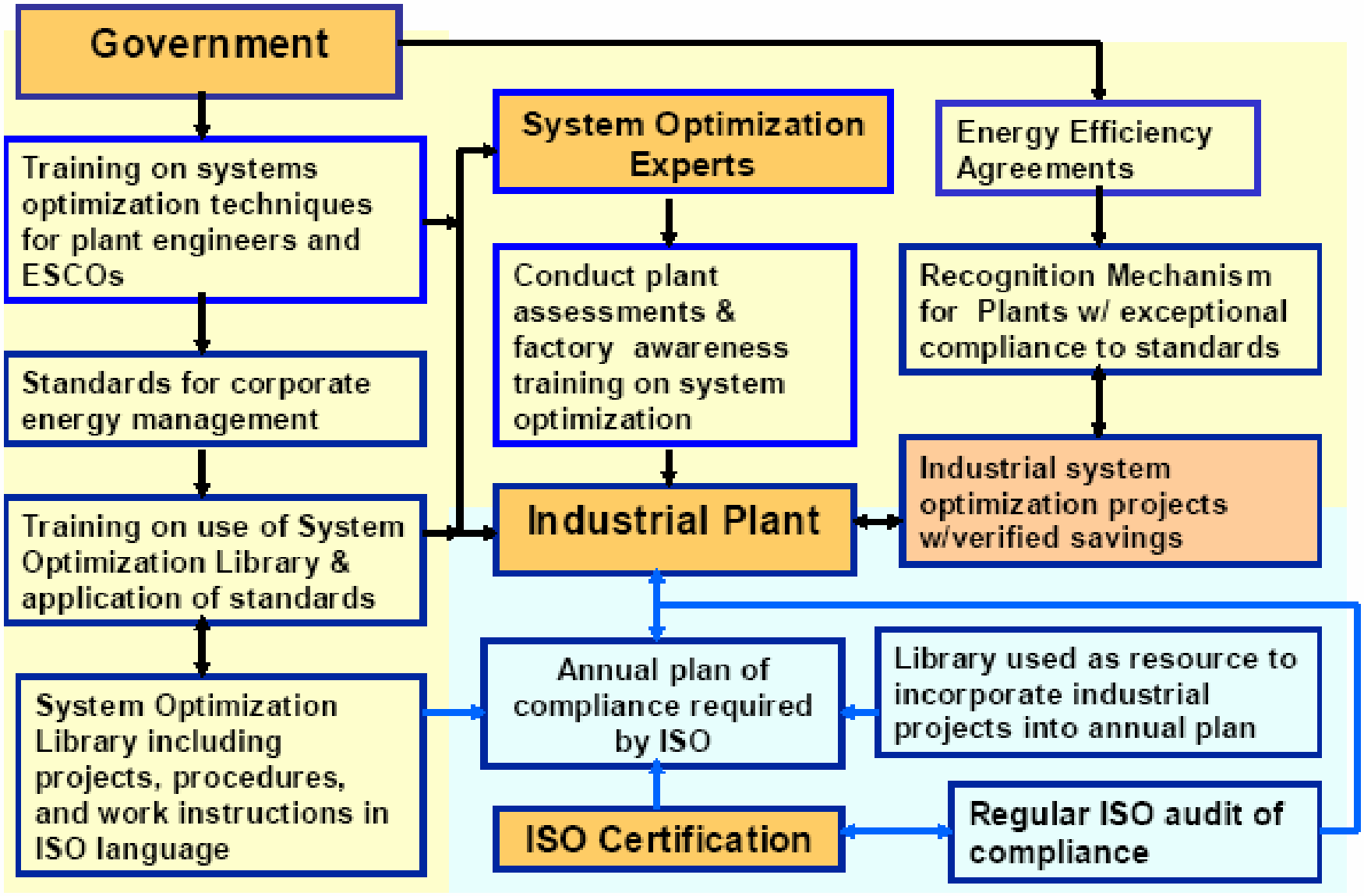
- How can system energy-efficiency be maintained in this complex changing environment?

Integrating energy efficiency into existing management systems

- **ISO Energy Management Standard**

  integrated on a voluntary basis within other ISO standards 9001, 14000 etc.

Proposed Industrial Standards Framework



Introducing an Energy Management Standard in South Africa

- **DME** : national strategy on Energy Efficiency
- **NEEA** : capacity building
- **Eskom** : DSM
- **Private sector** : signatories of Energy Efficiency Accord
- **SABS** : formulation of ISO standards
- **DEAT** : climate change

International support

- UNIDO methodology
- ISO international working group
- GEF (Global Environmental Facility) funding requires:
  - More then 50% of co-financing
  - Policy instrument in place to ensure the sustainability of the training (standard)

Submission of PIF to GEF

- US$ 13,6 million
  - US$ 5 million from a GEF
  - US$ 5 million from NEEA + SA government (capacity building)
  - US$ 1,8 million from signatories of EE Accord (investment)
  - US$ 1,8 million from Eskom DSM (investment)

Content

- Establishment of national standard
  - 1. National standard established in compliance with new ISO standard.
  - Local Infrastructure in place for accreditation
  - Local Infrastructure in place for auditing capability

Content

- Tools and training on Energy Management.
  - Systems optimization library (web-based guidance on compliance with Standard)
  - Training materials available for 4 sectors
  - Training sessions for National Energy Efficiency Agency and auditors trained and conducting training (training of trainers)
  - Training for companies : ESCOs and consultant, Companies: Plant staff, engineers, Middle Managers

Content

- Financial incentives supporting energy efficiency
- System optimization projects within companies

Expected Outcomes

1. National standard established in compliance with the new ISO standard.
2. Structure in place for accreditation, measurement and verification.
3. Industrial plants certified as Energy efficient through compliance with standard.

Expected Outcomes

1. DSM funds used to invest in Energy savings projects based on systems optimization underway in factories
2. Additional incentives in place by the SA government on a coordinated manner
3. Linkage to support measures to companies fulfilling the Black Economic Empowerment criteria.

Expected Impact

1. Reduction of EE consumption
2. Reduction of CO2 emission

Thank You