Addressing untapped opportunities through early equipment replacement

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How could a calculation methodology to prove the additionality of early product replacement look like?

- Additionality of an energy efficiency measure is the **supplementary impact** of a measure **beyond standard practices**

- The **baseline scenario** would be **the standard replacement at the end of the old motor's lifetime**, while additionality may refer to the early replacement by a new efficient motor, where the existing (old) motor would otherwise have remained in service until the end of its lifetime.

How could a calculation methodology to prove the additionality of early product replacement look like?

- Swiss comparative analysis (Jibran, Patel, 2017*) of different methods

1. Transparency
   - Is additionality accounted for?
   - What method, reference values are used?
2. Advanced vs. simplified methods: accuracy vs. challenges
   - reference standard technology for more complex systems (compressors, fans, pumps)
   - for motors easier
3. Careful estimation of investments & savings can lift investment barriers

*M. Jibran S. Zuberi and Martin K. Patel: The importance of additionality in evaluating the economic viability of motor-related energy efficiency measures, 2017

How could a calculation methodology to prove the additionality of early product replacement look like?

Costs (Energy investment)

- $E_{investment} = PV_{old} + I_{efficient} – I_{standard}$
- Equipment value depreciates quickly in the early years compared to closer to end of lifetime
- Most profitable to change an old motor once 2/3 of its lifetime has been reached
  (may not be true for motors with low running hours)

Energy savings (ES)

- $ES = ES_{during} + Es_{after}$
- During + after lifetime of old equipment
- Baseline for comparison:
  - during: old motor (IE2)
  - after: standard motor (IE3)

Subsidies

- Reward early replacement
  - x%: if replaced equipment exceeded its lifetime
  - 2x%: between 50% and 100% of its lifetime
  - 3x%: below 50% of its lifetime

- Ideally: subsidy is a compensation for the additional cost of the more energy efficient solution

What measures could be implemented to boost product replacement rates?

1. **Understanding** the stock and its characteristics (EU-wide study)
2. **Awareness raising** among end-users (non-energy benefits)
3. Create **alliances** (e.g. service companies)
4. **Capacity building** for qualitative energy audits (including motor systems)
5. **Subsidies**