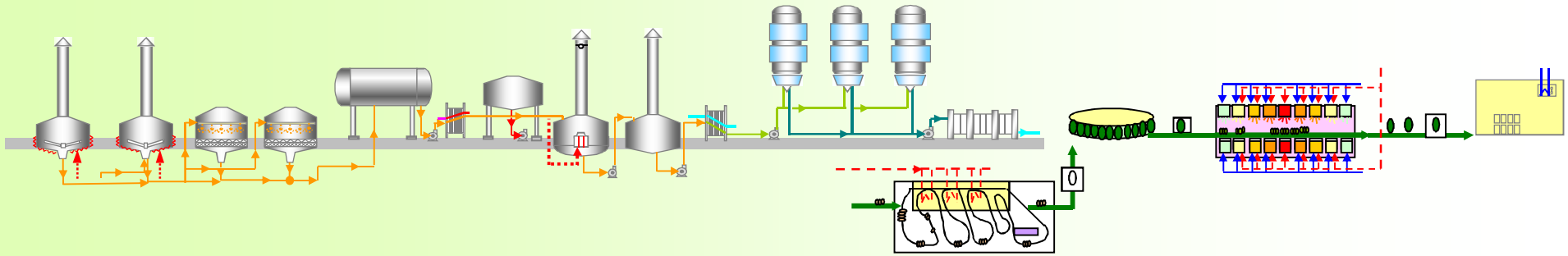


Integrated Energy Efficiency Activities at Beer/Beverage Factories Using Specific Energy Consumption Methods in South Africa

Climate Experts, Ltd.
Naoki Matsuo

n_matsuo@climate-experts.info

Climate Experts

Ai-Ai Energy Associates

RECYCLE ONE

Limits of CDM: How to resolve them?

- Projects with emission reductions < 10,000 tCO_2e/yr are infeasible
  - Administrative costs are high (Order of US$ 100,000)
- Limited number of projects in LDCs
  - Especially, private sector projects are rare
- Projects for rural development are limited in numbers
- SD-components cannot be fostered
- CDM-specific expertise is needed
  - Difficulties in demonstration of additionality
    - Barrier analysis is difficult to demonstrate; Local reality is not reflected
    - Energy efficiency projects are limited in numbers
  - Difficulties in pursuing monitoring completely
- Time-consuming
- CER revenue is a minor component (than other revenues) and delivered later
- Limited investment and technology transfer from industrialized countries
  - Annex I country's participant is a mere 'buyer' of CERs

CDM is driven by market for GHG emission reductions

Rules are very strict, thus **many opportunities are lost**...

⇒ How to reflect 'local reality' in the rules?

New Type of MRV—Procedural aspects

- Requirements: How the scheme ensures "reliability" of ER as well as reflects "local reality"

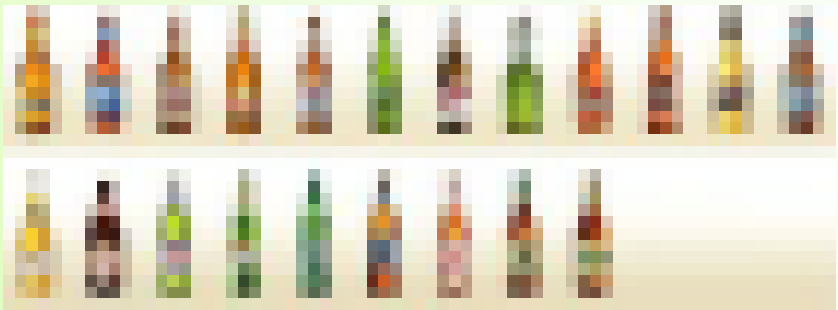
  Strong centralized governance system with top-down methodologies → Bottom-up methodology setting and review process(es)

  - Based on bilateral agreement by the governments concerned
  - No centralized approval process for methodologies which shall cover all developing countries
    - "Expert judgment" as the process for *ex ante* assessment
      - Not validation by the DOE (*i.e.*, non-expert in the sector/technology)
      - The rule specifies the competence of the expert(s) (or organization) below, and template for the assessment:
        - A third party; expert in the sector/technology; familiarity with local situation
      - Assessment for appropriateness: additionality, emission reduction formula, monitoring plan
        - Especially, existing of barrier to prevent the activity (for additionality)

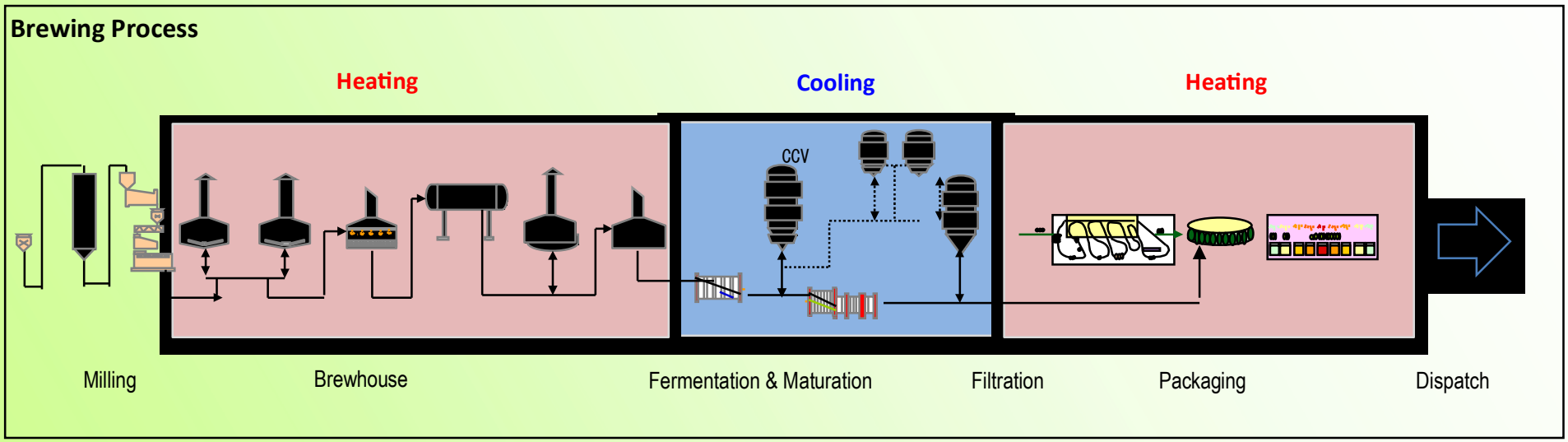
personal proposal

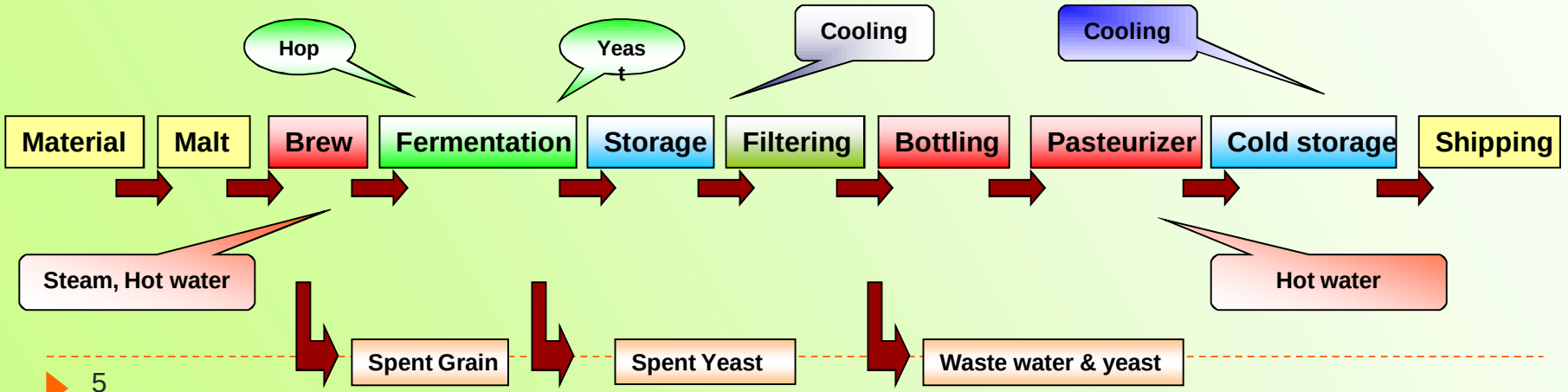
Beer Brewery Integrated Energy Efficiency Project

- Feasibility study of a beer factory of SAB Miller in Durban (Prospecton)
  - Energy analysis simulator for analyzing/auditing energy use
  - Integrated energy saving solution is provided
- Proven technologies in Japan
  - Kirin, Asahi, Sapporo, (Asia)
- Currently rather good energy intensity, but... *at least 30–40% fuel saving achievable* (*power: 15%*)
  - to be one of the most efficient brewery in the world
- Possibly expand to other SAB Miller factories also in whole over the world

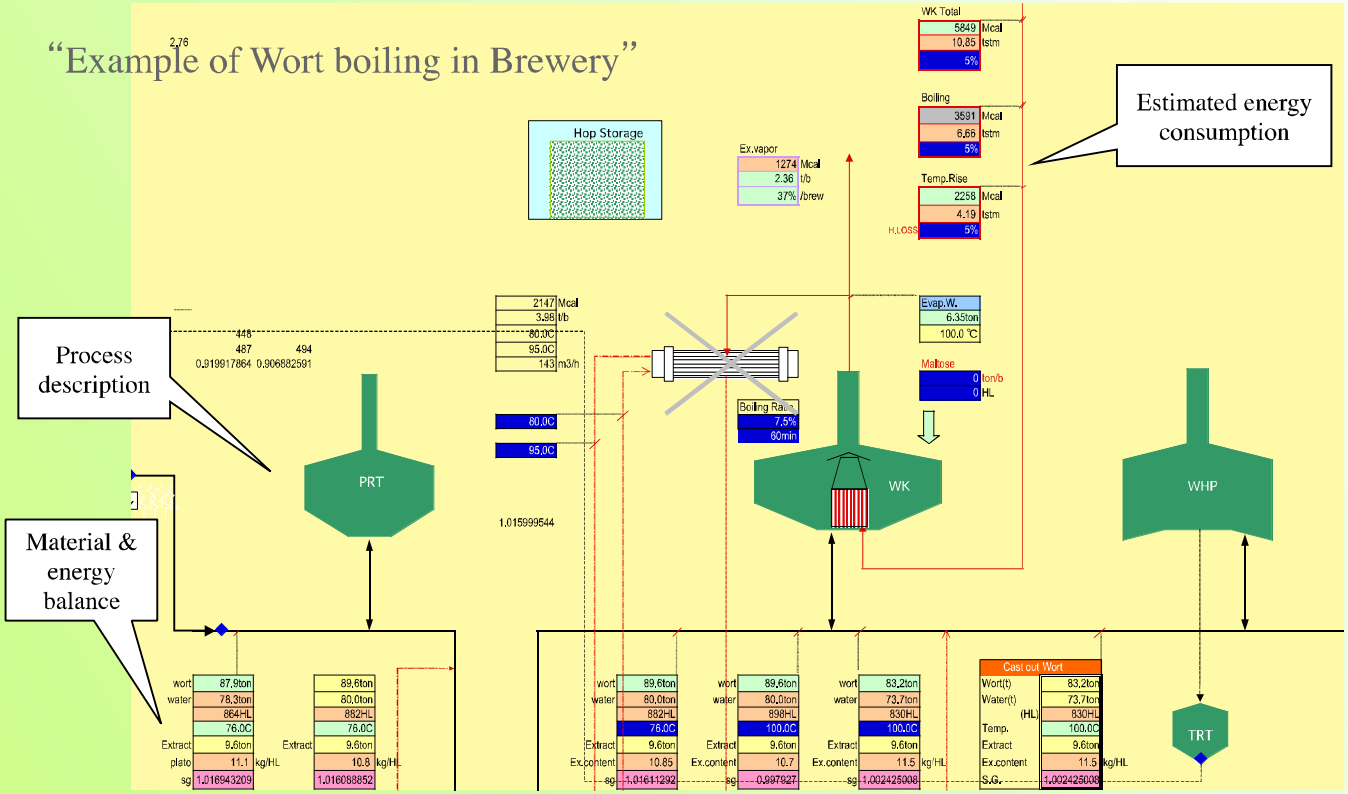


Beer Factory: Energy intensive food industry

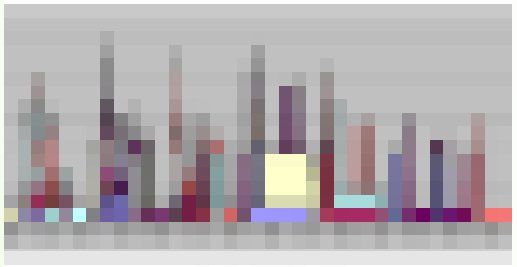




Energy Analysis Simulator for auditing/design

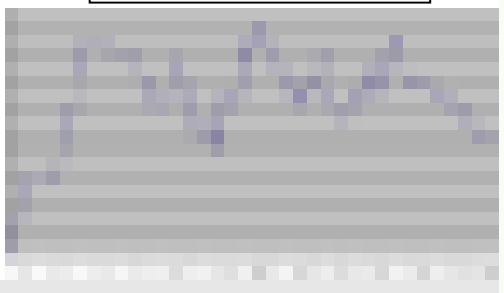


Steam consumption

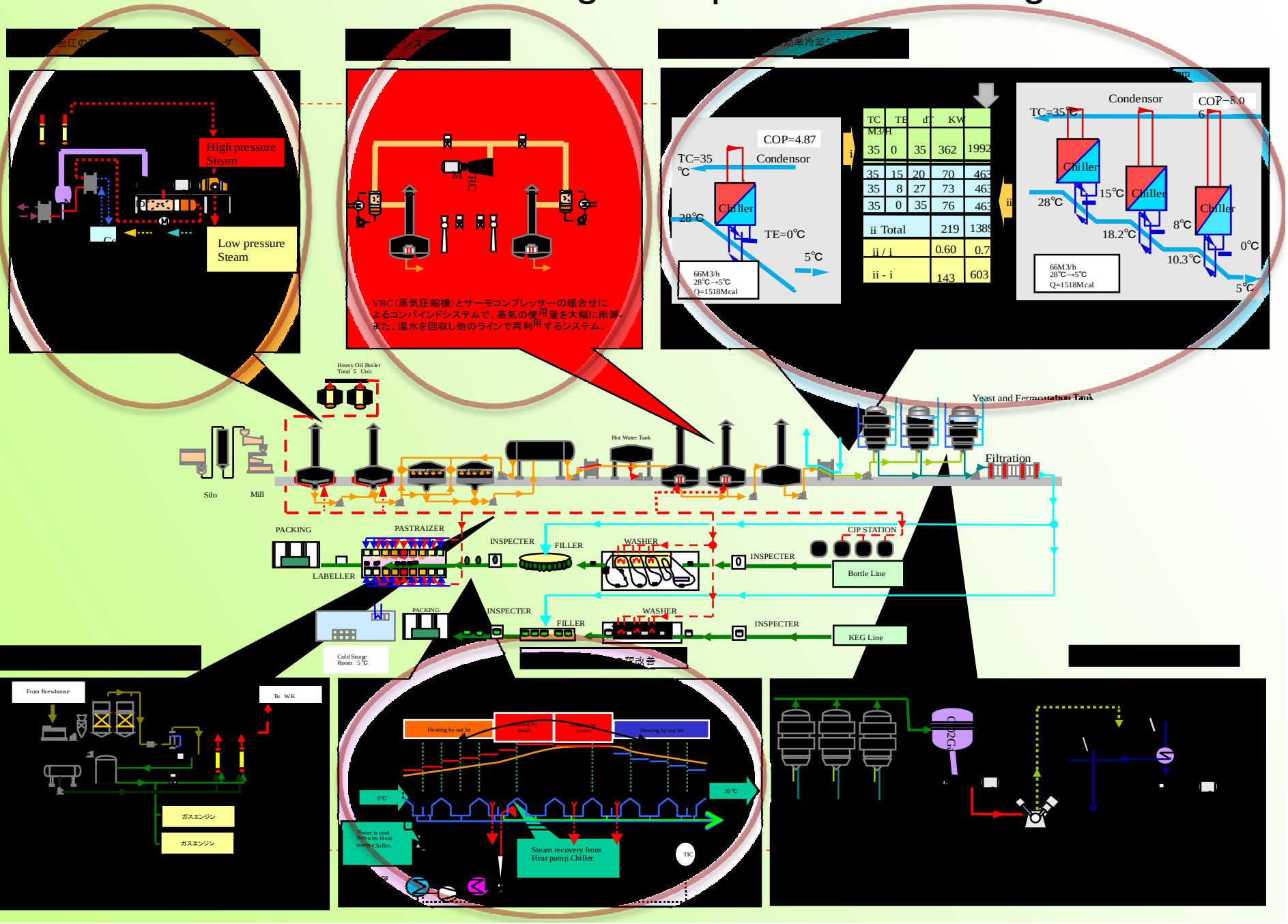


Total Cooling Load

CO_2 Emissions



Several Technological Options to be Integrated



Methodological Aspects

- Emission reductions

Specific energy consumption

=

$= \Sigma$ (improvement of energy intensity of beer production)$_y$ • (beer production)$_y$ • (CO_2 emission factor of energy)

  - Σ: summation over energies = fuel & electricity
  - Improvements by daily operation (Kaizen) can be counted.

- Q: If total beer production increases, CO_2 emissions my increase. Even so, can "emission reduction" be achieved?
- A: Yes. Emission reductions ≠ Difference from the past.
  - *BE* = (baseline intensity) • (beer production) • (CO_2 emission factor)

    PE = (project intensity) • (beer production) • (CO_2 emission factor)

  Reasonable assumption: Beer production is NOT affected by the project

We sometimes find un-theoretical (emotional) treatments in CDM

MRV for Kaizen Improvements and Co-benefits

- Project
  - Introduction of integrated energy recovery and utilization technologies for various processes as well as "**energy management system**" with PDCA
- Benefits
  - Better quality beer production (by energy management)
  - Minimize yield loss in packaging process (ditto)
  - Energy cost saving
  - Water cost saving
  - (No need for organic waste water treatment)
  - (Carbon credits)
- Monitoring
  - Hourly energy management

How to incentivize staffs...

Japan has introduced institutional arrangements by law for factory's energy management

PDCA: (Procedures for) Plan-Do-Check-Act