

## Q-Proc Energy audit program

### Objectives

Typically energy savings in the range of 10 to 30% of the present total energy costs for gas, oil, coal and electricity consumption (primary energy sources) should be expected.

The audit is characterized by a hollistic approach considering all energy related processes and streams, a structured, proven methodology and identification and quantification of detailed energy savings ideas.

By means of the one-week energy audit the customer will get an up-to-date overview of all energy savings measures and possibilities assessed with the help of developed toolboxes and check lists for 20 generic key energy savings areas, including project descriptions, calculation details, quantified energy savings in Mwh(th), MWh(el) and RMB, investment budget estimates and payback time, providing a valuable base and working list for future CAPEX<sup>1</sup> and OPEX<sup>2</sup> budgeting and yearly initiatives. The working list with identified projects typically consists of min. 40 to max. 70 projects across all areas.

There are only a very few other energy consulting companies who are capable of achieving this in one week.

Following specific areas are taken into account:

1. Power plant, primary energy consumption and energy generation
2. Steam en condensate systems
3. Electrical distribution systems (reactive power, peak loads, zero loads)
4. Fresh water consumption
5. Waste water and sludge treatment
6. Hot water consumption
7. Chilled water consumption
8. Vacuum generation and systems
9. Compressed air systems
10. Refining and deflaking
11. Hood ventilation en machine hall ventilation
12. Motors and drives
13. Pumps and agitators
14. Excess heat and heat losses
15. Hall and office lighting
16. HVAC<sup>3</sup> systems
17. Process variability
18. Energy metering & monitoring
19. Energy related preventive maintenance
20. Energy management, KPI's and awareness

### Deliverables

- Project long list – listing approximately 40 to 50 projects - including a detailed description, rough and first investment estimates (accuracy +/- 25%), energy savings potential quantifications and financial profitability (with payback time) allowing for further prioritization
- Several macro mass and energy balances for e.g. boiler house, steam System, electrical consumption etc., a temperature degradation diagram and many calculation details with underlying technical assumptions and formulas
- Final report with executive summary, total energy savings potential, synthesis of collected data, project details, project long list, conclusions and recommendations

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<sup>1</sup> Capital expenditures

<sup>2</sup> Operational expenditures

<sup>3</sup> Heat, ventilation and air-conditioning

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In a next step a further fine-tuning of selected, individual projects according to the DMAIC methodology (define, measure, analyze improve and control) can be performed in order to determine the technical and financial feasibility of the projects and to prepare documents required for capital expenditure approval.

Auditors

2 persons (senior level energy efficiency consultants with more than 20 years experience in the pulp & paper industry)

Audit duration

5 days

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