Problem

Manufacturing companies become incremen-
tally responsible to develop sustainable
products and services. Increasing energy
costs and price volatilities as well as unpre-
dictable impacts of a nationwide change in
energy supply towards sustainable energy
sources lead to an increasing demand in
energy efficient production machines. Same
reasons increase pressure on operators
of production systems to lower energy
consumption in order to decrease costs and
risks. Simultaneously, in the frame of the
Ecodesign Directive of the European Com-
mission, regulation regarding guidelines,
measures, and documentation to improve
energy efficiency can be anticipated in
the future. The implementation of energy
efficiency measures and energy manage-
ment systems according to DIN EN 16001
(replaced by ISO 50001) requires individual
solution approaches and is not sufficiently
supported.

Offer

The Fraunhofer IPK identifies energy and
resource improvement potentials and
develops a tailored concept on how to tap
these potentials. During the development
and construction process manufacturers of
production machines will be continuously
supported in integrating energy efficiency
aspects. To the operators of production sys-
tems, measures will be demonstrated, that
include technical and organizational chan-
ges to reduce the energy consumption. A
fundamental working basis is founded on
a close cooperation between Fraunhofer
consultants and the clients’ experts. Mea-
ures will be assessed against economic
and environmental standards. The target
is to significantly improve single aspects of machines in regard to its energy consumption and its environmentally friendly use of process media. Simultaneously, measures should pay back in mid-term and should contribute to a cost reduction in the long term.

**Approach**

1. **State of the Art Analysis**
   - determination of relevant data for state of the art analysis,
   - generation and collection of machinery and usage relevant data; supported by own measurement equipment,
   - identification of energy efficiency requirements of customers during the development of new machines,
   - completion of energy and media flow plans,
   - analysis of load profiles.

2. **Data Evaluation and Potential Analysis**
   - determination of current energy usage profiles,
   - identification and description of significant levers to increase efficiency.

3. **Selection and Evaluation of appropriate Measures and Instruments**
   - determination of specific implementing measures to increase energy efficiency,
   - total cost of ownership calculation for single measures,
   - prioritization of single measures and development of change concepts.

4. **Advise and Support during the Implementation Process of Energy Efficiency Measures**
   - advise and support during the introduction of technical and organizational changes,
   - professional and content related moderation of technical meetings.

**Benefit for the Client**

For operators of production systems:
- reduced costs achieved through energy efficiency improvements,
- reduced energy supply risks,
- improved competitiveness achieved through cost reductions and improved productivity,
- sensitized the staff in regard to energy efficiency,
- active commitment to a sustainable economy.

For manufacturers of production machines:
- increased knowledge regarding own products through energy consumption transparency,
- improved market position and competitiveness,
- foresight commitment in regard to potential regulation.

**Measurement Equipment**

Measurement of electric power up to 40 kW (upgradeable) with mobile measurement kit:
- electric current measurement up to 60 A~ with 6 x 3 wires (resolution = 0.1 A),
- voltage measurement simultaneously,
- power determination (apparent power, reactive power, and active power),
- cos-Phi measurement,
- measurement of the harmonic content in percentages.