Rexroth 4EE
Rexroth for Energy Efficiency
Looking to save energy? Why not increase productivity at the same time?

Lowering operating costs while using energy more efficiently and conserving resources – as a company, your business and environmental objectives must be aligned. We are with you every step of the way.

Greater Energy Efficiency is Your Long-term Solution
Energy is becoming more scarce and expensive all the time. At the same time, demand is on the rise. The focus today is therefore on technologies that help to resolve this problem. Rexroth, an experienced partner in the area of renewable energy, plays an important role in making this power source a viable alternative. Until all challenges of generating power have been overcome by developing sustainable solutions, you can use our four technology levers to optimally leverage energy that is readily available: The Rexroth 4EE systematic approach can lower your energy costs and reduce CO₂ emissions while maintaining or even increasing productivity.

Rexroth 4EE – Rexroth for Energy Efficiency
The potential for saving energy can only be maximized when every aspect of an industrial plant or mobile machine is considered. The unique Rexroth 4EE systematic approach, developed specifically for industrial sectors, reveals the opportunities for all of the technologies you employ. It serves as a basis for comprehensive energy efficiency consulting, which accompanies you all the way from analysis to implementation.
Looking to use energy more efficiently? The 4EE systematic approach is what you've been looking for.

Lower costs and energy consumption while increasing productivity. With the 4EE systematic approach, you can identify areas of improvement across all automation technologies and machines.

**The 4EE systematic approach bundles all relevant technologies.**
Maximum efficiency can only be achieved when your plant is viewed as a whole. Rexroth is very experienced in all types of drive and control technology, which is why we developed the universal 4EE systematic approach. It allows you to improve efficiency for all automation applications and machines.

The system comprises four levers that harmonize to improve the energy efficiency of your plants or mobile application. Extensive, cross-technology application support throughout the entire engineering process forms the basis. Optimized components lower energy requirements and boost productivity. Actively regulated drives, which provide only the amount of energy needed, also reduce consumption. Recovered braking energy can be kept in the system or fed back into the mains.

**Energy Efficiency as a Defining Corporate Factor**
Using energy efficiently and reducing emissions lower operating costs. Better productivity as a result of optimized processes gives you the edge in the competitive global arena. You also meet international environmental requirements more easily.
Rexroth for Energy Efficiency

**Competency across all technologies**
You can optimize your energy efficiency in all phases of the machine life cycle. Isolated individual measures implemented in complex systems typically lead to only minimal success.

Rexroth understands your requirements and knows how you can leverage the potential of all technologies. Whether it be electrics, hydraulics, pneumatics, individual components, or integrated solutions, our decades of experience has made us familiar with a wide range of complex dynamics. Our 4EE systematic approach helps you identify and exploit all areas in which energy can be saved, from design through to modernization.

- **Energy System Design**
  Systemic overall view, design, simulation, consulting

- **Efficient Components**
  Products and systems with optimized efficiency

- **Energy Recovery**
  Recovery and storage of excess energy

- **Energy on Demand**
  Energy usage on demand, stand-by mode

Application in the entire machine life cycle

Each stage of the machine life cycle presents different opportunities for implementing energy-efficiency measures.
Four levers that work across the board.

Energy System Design

The best machine concept for your tasks
Your plant is a complex system. In order improve energy efficiency, then, it is critical that your system be viewed as a whole long before you start using it. Mechatronic simulation lets you optimally configure your machine or plant from the beginning. Existing concepts can also be improved with software solutions that help you analyze and reduce energy consumption, cycle time and air consumption.

Efficient Components

Energy-Efficient, Perfectly-Matched Components
Choose energy-efficient products or modules for every automation task: From highly-efficient servo motors, distributed drives and axial-piston variable pumps through to roller rail systems with low coefficients of friction, the Rexroth portfolio has the perfectly-matched components to ensure peak performance. Optimized hydraulic pumps, for example, noticeably reduce the fuel consumption and emissions of your mobile machines and commercial vehicles while allowing you to achieve much higher levels of efficiency.
Do you use a wide variety of drive and control systems? Our four levers help you improve energy efficiency across all technologies.

Energy Recovery

Recovering, storing and using excess energy
Energy is too valuable to waste. Using the HRB hydraulic hybrid drive, accumulator charging circuits, or electric or kinetic buffering, you can put the valuable surpluses of energy to productive use in your industrial or mobile applications.
Highly efficient servo drive controllers enable braking energy to be recovered. Energy can be buffered, sent to other axes, or fed back into the mains.
Profit from our know-how: Rexroth has considerably influenced and advanced the development of solutions for exchanging oscillating process energies – within and between the different drive technologies.

Energy on Demand

Supplying energy as needed
Lower the energy consumed by your electric, hydraulic and pneumatic actuators.
Use controllers that you consume only as much energy as you need – in factory automation, system engineering or mobile applications.
Situational pressure controls for all control principles, frequency converters for economic speed controls, variable-speed pump drives for reduced idle power, or on/off valves for energy switch-off during breaks – choose the solutions that make your machines and plants more efficient.

Drives for brake energy recovery
Sytronix variable-speed pump drive
Your options for saving energy are diverse. Our 4EE systematic approach is unique.

**Actively reduce operating speeds in line with requirements**

Variable-speed pumps can reduce the energy consumed by a edging press by up to 44 percent by lowering speeds during partial-load operation and down to zero during breaks. This minimizes direct energy requirements and heat levels to such an extent that cooling is normally not required. Regenerative drives automatically switch to generator mode for downward movement or decompression to produce energy that can be resupplied.

**Use braking energy to accelerate**

As a fleet operator of garbage trucks and distribution vehicles or school and city buses, you can reduce fuel consumption and CO₂ emissions by up to 25 percent by utilizing braking energy that would otherwise be wasted. The HRB hydraulic hybrid drive converts kinetic into hydraulic energy when the vehicle is braked. This energy is then stored and used when the vehicle accelerates again. The combustion engine does not have to perform as much work as a result. Bonus for people and the environment: Diesel particulate matter is also reduced.
Saving energy means using it intelligently. The 4EE systematic approach provides you with cross-technology solutions for your machines and plants.

**Reduce cabling with decentralized units**

An optimized parcel sorting facility that operates 12 hours a day, 300 days a year, uses approximately 23,400 fewer kW hours of electricity in a 12-month period. CO₂ emissions are also reduced by a good 14 tons. For this, we have also connected up to 20 IndraDrive Mi drives in a load circuit. A modern supply unit feeds braking energy back into the supply network. This prevents braking energy from otherwise being lost in the form of heat. Control electronics and servo motors likewise create a compact unit, which reduces cabling outlay by up to 85 percent.

**Adapt cooling to requirements**

Hydrostatic fan drives from Rexroth help maintain strict emissions regulations for your mobile machines and buses while reducing fuel consumption by up to 5 percent. To achieve this, electronically controlled hydrostatic fan drives operate independently of engine speed to provide exactly the amount of cooling required so that the engine runs reliably in an optimal temperature range, even under the most difficult conditions.
Energy Efficiency Consulting

Consulting that identifies your energy saving potential and accompanies you in implementing measures to this end.

From analysis to implementation
Do you want greater energy efficiency in your production lines or machines? Energy efficiency specialists at Rexroth can show you all relevant areas in which energy can be saved by analyzing your entire system. Specific optimization concepts are then designed based on the 4EE systematic approach and backed by profitability calculations. What's more, consulting encompasses all automation technologies and machines used in your production environment. Your Rexroth energy efficiency specialist will also help you implement agreed upon measures and evaluate the results.

► As a technology user in an existing plant, you save energy and reduce operating costs and emissions.
► If you are developing a new plant, you receive support during the requirements specification phase so that you can compete better with a more innovative product.
► Both profit from each other, since the knowledge gained gives you an in-depth understanding of energy-efficient machines and plants, and you internalize the cost-benefit situation. Requirement descriptions and configurations are also greatly simplified.
The Rexroth Energy Performance Pledge

You benefit from our own experience in the transition to greater energy efficiency. For every measure we recommend to you is already implemented in our own plants to lower CO₂ emissions by 20 percent by the year 2020.

Practical knowledge
Your costs for the transition pay off in only a few years in the form of low electricity costs. How do we know this? Pilot projects in different Rexroth plants have shown that machine manufacturers and industrial operators can achieve a much higher level of energy efficiency when the 4EE systematic approach is applied – without having to replace all of your existing machinery.
Rexroth considers all angles for our energy efficiency
- Energy saved
- Operating costs lowered
- Emissions reduced
- Productivity increased
- Competitive edge secured
- Legal requirements maintained
- Social expectations fulfilled
- Image enhanced through environmentally-compliant production