Energy Efficiency Solutions

IE5

Systemiz

LEROY-SOMER™

Motor & Drive solutions for energy savings and a better environment

Nidec

All for dreams

Energy Efficiency

What is Energy Efficiency?

Improved energy efficiency allows businesses to reduce costs and cut emissions in the face of constantly increasing demand for electricity.

Energy efficiency is achieved primarily by means of more efficient technologies or processes.

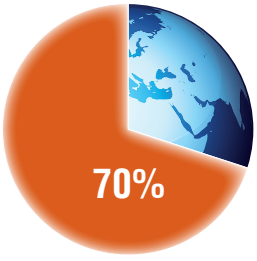
Electricity usually represents a significant proportion of a business's total energy costs. Given the current economic situation, it is ever more important to improve competitiveness by cutting energy costs.

Energy efficiency targets and policies

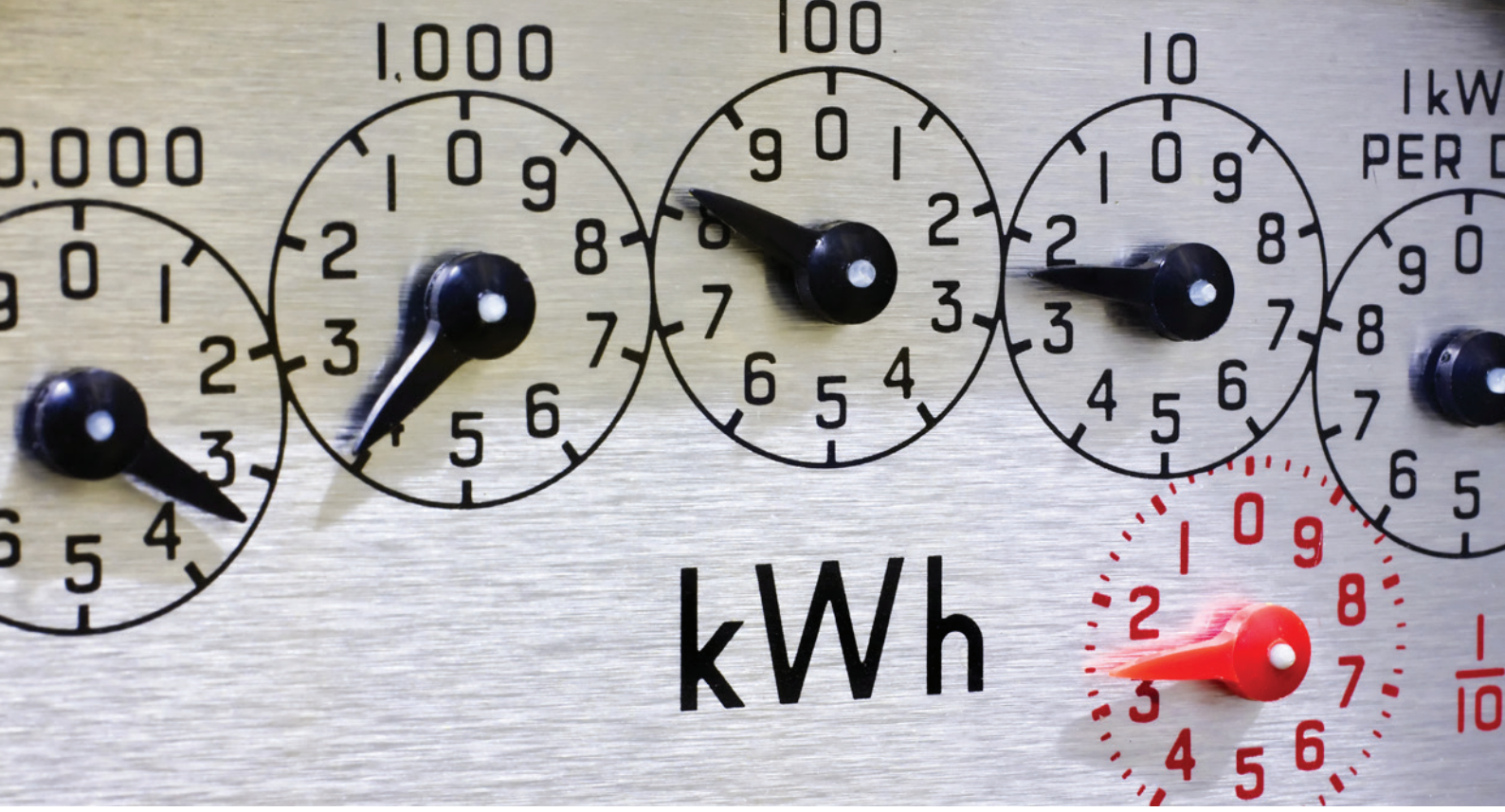
Energy efficient buildings, industrial processes and transportation could reduce the world's energy needs in 2050 by one third, and help control emissions of greenhouse gases.

The European Union, along with the United States and other countries, aims to reduce CO2 emissions by 55% by 2030.

In 2015, electric motors represented 70% of industrial energy consumption. There is significant potential to reduce this.



Electric motors
Worldwide industrial energy consumption
(source: ADEME)



To emphasize potential efficiency gains, some supports have been created on a national scale while others have been created for geographical areas. They include incentives, financing and standards.

Government tax incentives

Individual governments offer a variety of tax credits, rebates and other incentives to support energy efficiency, encourage the use of renewable energy sources, and support efforts to conserve energy and reduce carbon footprint.

Standards & directives

Various regulations have been introduced and will soon increase to force the manufacture and use of higher efficiency motors. A classification has been created by defining motor efficiency levels.

IEC 60034-30-1 defines 4 classification from IE1 to IE4 while Nema MG-1 Table 12-11 and 12-12 assign high and premium efficiency. Both standards tend to align their content to have coherent values in different areas. The premium efficiency in Nema is equivalent to IEC IE3 level.

Since 2016, the CEI regulation TS 60034-30-2 complements this standard by specifying 5 performance classes for variable speed electric motors, from IE1 to IE5.

ISO international standards can help solve the energy challenge by increasing energy efficiency, and promoting the development of renewable energy technologies.

White certificates, also known as “Energy Efficiency Certificates” (EEC), are tradable instruments giving proof of the achievement of end-use energy savings through energy efficiency improvement initiatives and projects.

As a result, each industry should be more conscious of and engaged with energy efficiency issues.

Choosing the highest efficiency solutions

Choosing the most suitable solution is not an easy step since different options are available. What are the advantages of variable speed rather than fixed speed? Should we consider induction or synchronous motors? The following sections help select the right technology and architecture to achieve your company's goals for operating expenditure, return on investment (ROI), reliability and serviceability.

Fixed speed solutions

Fixed Speed motors

On applications where the need is nearly constant, fixed speed solutions with a motor connected direct on line provide the highest efficiency level.

The selection of a motor's minimum efficiency class is to be done according to local regulations. Whenever available a higher class will provide maximized efficiency (there is a minimum of 15% fewer losses from one class to the next).

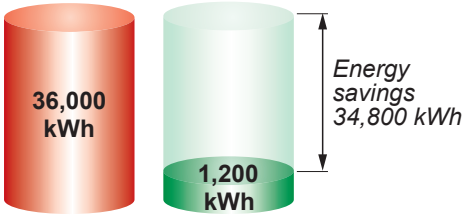
Soft Starters

When started direct on line, induction motors use 6 to 8 times their nominal current for a short period of time leading to either oversized utility contracts or inrush current penalties. Soft starters, providing starting current limitation, are an economical way of saving these costs while providing maximum motor protection.

A soft start will also save on maintenance costs as system components will be less exposed to stress and shocks.

Once started, soft starters with automatic integrated bypass will save over 4 W/A that would be wasted if the electronic power components of the soft starter remained in the line.

Example of savings using a bypassed soft starter:
P = 550 kW - In = 940 A - 8,000 h/year
Energy savings: ~ 34,800 kWh
(only 150 W of losses in a 1,000 A bypassed soft starter compared to 4,500 W if not bypassed)



Variable speed solutions

In applications where need varies throughout the day or year, the impact on energy can be very different depending on the solution you choose.

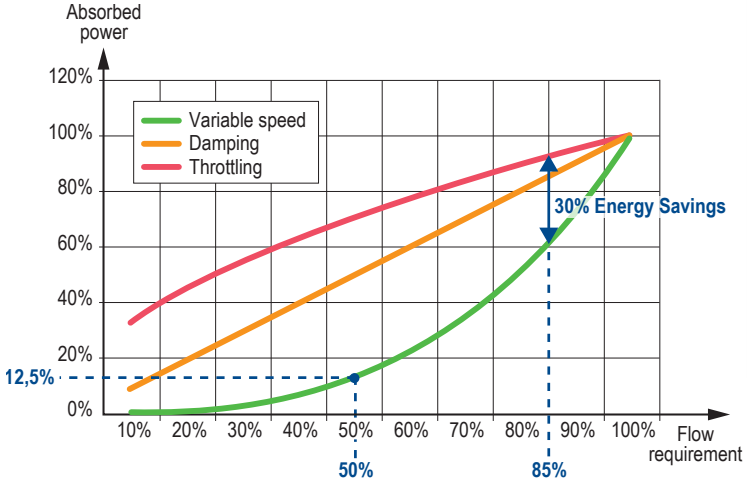
Mechanical regulation vs variable speed

The vast majority of fans, pumps and compressors, representing 2/3 of motor energy consumption worldwide, are driven by fixed speed motors connected direct on line. Any necessary variation in system output is generally achieved by throttling or damping the system with a valve or a damper.

Replacing mechanical regulation with a motor speed adjustment solution will considerably reduce power consumption and save on maintenance costs for mechanical components. Very often a full return on investment (ROI) is achieved within a year.

Focus on centrifugal applications:

When varying the speed of fans, pumps or any other centrifugal applications, the absorbed power is proportional to the cube root of the speed. In other words, at 50% flow, the energy consumed is only 12.5% of the motor nominal power. Even at a modest 15% reduction in speed, energy savings compared to the throttling method are 30%.



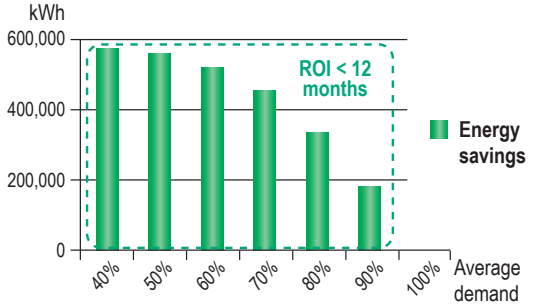
Example

Centrifugal Application requirements

100 kW - 1,500 rpm nominal - 8,000 h/year

Mechanical regulation: IE3 IMfinity® motor 110 kW

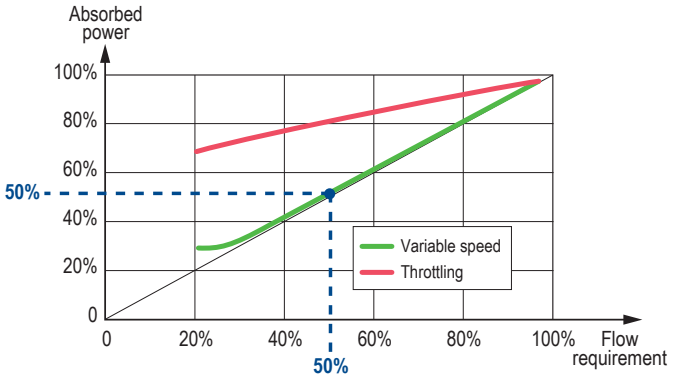
VSD solution: IE3 IMfinity® motor 110 kW + Power-drive



Yearly energy savings on average flow provided by VSD solution vs mechanical regulation

Focus on constant torque applications:

With constant torque applications like air or refrigeration compressors, absorbed power is proportional to the speed. At half flow requirement the energy consumed is 50%. Converting mechanical flow regulation to variable speed provides return on investment in less than a year when flow requirements average 70% or less.



Example

Constant Torque Application requirements

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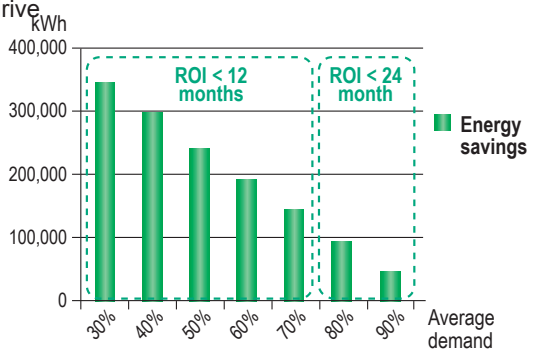


Yearly energy savings on average flow provided by VSD solution vs mechanical regulation

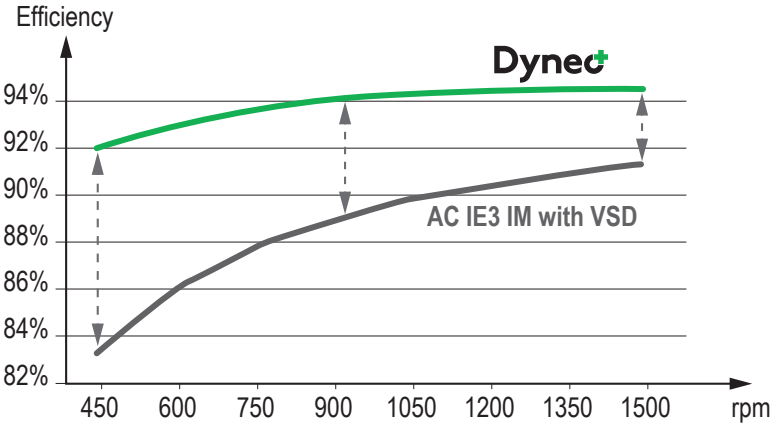
Selecting the right motor technology

Choice of technology: Induction vs Synchronous motor combining reluctance and permanent magnets

When it is necessary to vary the speed of a motor to suit flow requirement, using a synchronous motors combining reluctance and permanent magnets (PMSynRM) results in a major energy saving compared to a standard AC induction motor (IM).

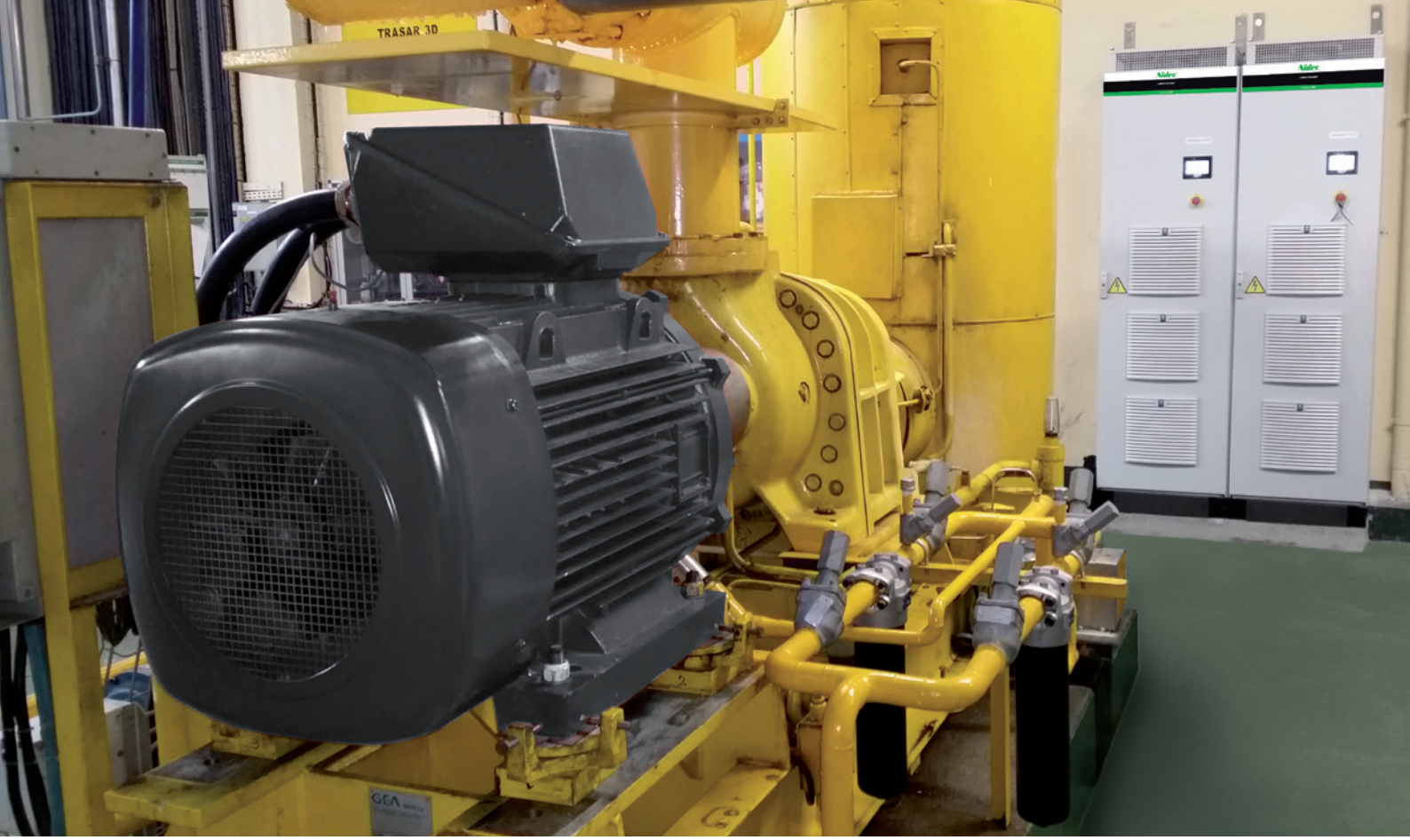
At nominal speeds, the efficiency of a synchronous motors combining reluctance and permanent magnets is significantly higher than any inverter driven induction motor.

Below nominal speed, the difference becomes even more important as the efficiency of a synchronous motors combining reluctance and permanent magnets remains almost constant whereas induction motor efficiency declines fast.



AC IE5 PMSynRM Dyneo+
IE5 synchro-reluctants & permanent magnets motors solution

AC IE3 IM
AC IE3 asynchronous motors & drive solution



Focus on centrifugal applications:

Since at low speeds, absorbed power is very low, the advantage of synchronous motors becomes significant when average demand exceeds 60%.

Focus on constant torque applications:

Because of the absorbed power being proportional to the speed, the impact of the better efficiency of synchronous motors is constant over the entire operating range providing significant additional savings compared to induction motor solutions.

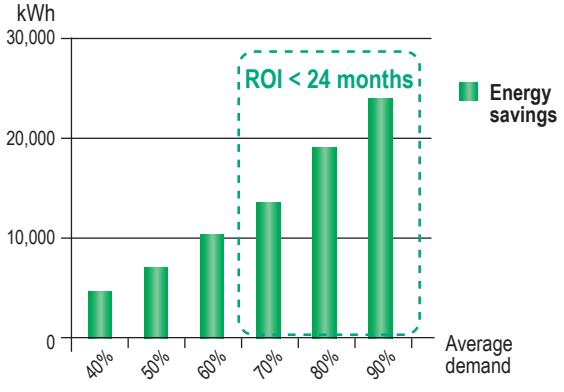
Example

Application requirements

100 kW - 1,500 rpm nominal - 8,000 h/year

VSD AC IM solution: IE3 IMfinity® motor 110 kW + Powerdrive

Dyneo+ synchronous solution: IE5 LSHRM motor 105 kW + Powerdrive



Additional yearly energy savings on average flow provided by **Dyneo+** package vs VSD IE3 induction motor + drive

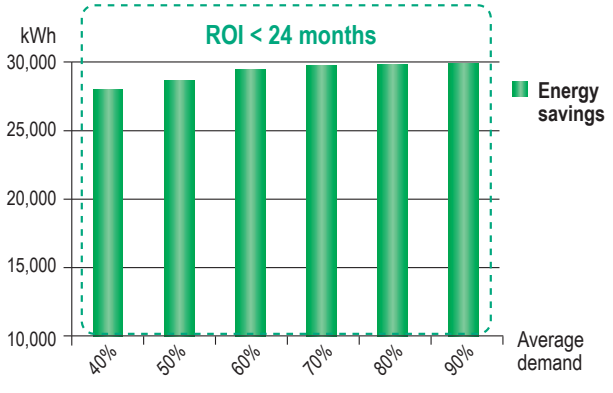
Example

Application requirements

100 kW - 1,500 rpm nominal - 8,000 h/year

VSD AC IM solution: IE3 IMfinity® motor 110 kW + Powerdrive

Dyneo+ synchronous solution: IE5 LSHRM motor 105 kW + Powerdrive



Additional yearly energy savings on average speed provided by **Dyneo+** solution vs IE3 induction motor + drive

Optimizing your architecture to get the greatest advantages

Choice of architecture for higher benefits

On any given application, requirements can be fulfilled in different ways, each of them providing advantages. The best choice is the one that provides the best possible compromise between important commercial considerations such as energy saving, capex, opex and serviceability.

	Energy efficiency	Initial cost	Serviceability	Operating range	Wear sharing
 **Single large system meeting maximum requirements**	High energy efficiency solution if the application has a limited operating speed range.	✓ Best compromise between costs of products, controls, installation and foot print	No alternative during downtimes	Limited by minimum speed of system	N/A
 **Multiple variable speed PMSynRM in parallel**	✓ Higher energy efficiency solution over a wider operating range than above	Higher cost of products compensated by top advantage position in other topics	✓ Systems being equivalent, easy to use one system to overcome one system down	✓ Wide operating range from minimum speed of one system to maximum of the total quantity	✓ System being equivalent, easy to share the wear with limited controls and suitable application software
 **One variable speed PMSynRM + multiple fixed speed**	✓ As high as above if IE4 IM motors with bypassed soft starters are used	Lower cost than above but difference in technology weakens serviceability and wear sharing	Not as high as above due to PMSynRM motors not being able to be operated without a VSD	✓ Wide operating range from minimum speed of the variable speed motor to the maximum capacity of the system	Limited to alternating the IM motors
 **One variable speed IM + multiple fixed speed with alternative feature**	Not as high as above. Energy efficiency depends on energy class used for the IM	Lowest cost for products but penalized by significant cost for controls (power contactors + associated automation)	✓ Systems being compatible, easy to use one system to overcome one system down	✓ Wide operating range from minimum speed of the variable speed motor to the maximum capacity of the system	✓ Alternating the variable speed system via the power contactors and relevant application software will provide the wear sharing

PMSynRM: synchronous motors combining reluctance and permanent magnets
IM: induction motor
VSD: variable speed drive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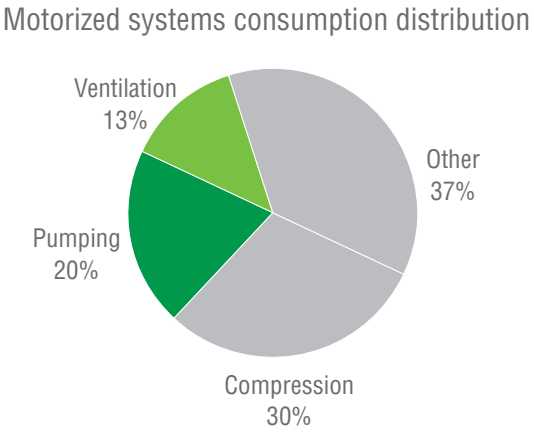
Maximizing energy efficiency with Pumps and Fans

Considering an aging installed base that is mainly fitted with old motors and mechanical regulation systems, huge energy savings can be achieved in almost every single application. To contribute to significant energy efficiency improvements, we must appraise and monitor how energy is used and identify specific areas for development. In the majority of cases, it is the complete systems and processes that should be optimized to get maximum savings.

Pumping, Ventilation

Pumping and ventilation represent one third of the consumption of motorized systems. The most effective way to realize energy savings in pump and fan applications is to include a variable speed drive in the system. This enhances process operations, particularly where flow control is involved. Drives also provide precise electrical motor control, enabling motor speeds to be ramped up and down or maintained at a required speed.



Case study: air conditioning system

Challenge

To create a highly efficient, environmentally friendly and reliable air conditioning system by converting it from fixed speed to variable speed without compromising the site's operations.

Former installation

2 x 90 kW fixed speed pumps used for carrying cooling water were operated at 100% flow during summer but at 50% only during winter (regulated by valve position)

30 x air treatment units including 2 x 22 kW fans averaging at 75% load over the year (regulated by louver position)

Our IE5 solution

2 x LSHRM 85 kW + Powerdrive F300 on pumps

60 x LSHRM 22 kW + Powerdrive F300 on pumps

Benefits

More than 5,000,000 kWh (worth the average power consumption of 1,000 households) is saved every year on the complete system which is about 350,000 USD a year. The return on investment was less than 12 months.

Maximizing energy efficiency with Compressors

Compression

Compression by itself represents one third of the consumption of motorized systems. Whether it is for air or cold production, compressors are exposed to a large variety of demands where variable speed synchronous solutions will provide the highest efficiency as well as the smoothest and most reliable operating conditions.

Focus on refrigeration:
In a refrigeration plant, energy consumption is by far the largest cost center. During the past 30 years, industrial energy consumption has grown by 186% whereas industrial refrigeration energy consumption has grown by 237%.

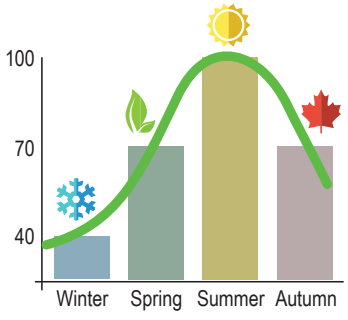
Industry sector	Energy used for refrigeration
Cold storage	85%
Frozen food	60%
Chiled ready meals	50%
Confectionery	40%
Breweries	35%
Liquid milk processing	25%

In addition to the obvious energy saving potential, refrigeration is the first activity where new standards, based on seasonal influence, activity fluctuations and outside temperature, allow calculating a system performance at part load rather than full load.

Seasonal efficiency
One of the main regulations, defined as ESEER (European seasonal energy efficiency ratio) or IPLV (US integrated part-load ratio) has been to introduce the seasonal efficiency which is about part-load efficiency.

ESEER = (0.03 x EER100%) + (0.33 x EER75%) + (0.41 x EER50%) + (0.23 x EER25%) where it must be understood that performance at full load only accounts for 3% of the operating time whereas performance at 50% load accounts for 41%

IPLV = (0.01 x EER100%) + (0.42 x EER75%) + (0.45 x EER50%) + (0.12 x EER25%)



The best way of reaching a high system performance at part load in refrigeration is the use of variable speed synchronous packages.

Case study: refrigeration in a slaughtering company

A leader in slaughtering and meat processing has entered a vast energy saving program. Cold production represented more than half of their electricity bill, so improving the coefficient of performance of the refrigeration system was a priority.

Challenge

Prior to standardizing on a solution, a trial was initiated in one of the plants.

Former installation

3 compressors, each driven by a 315 kW, 3,000 rpm fixed speed induction motor, were providing a maximum of 1,300 kW of cooling capacity. The adjustments to the requirements were achieved by setting the slide valve position of each compressor. Over a year this system was using 2,635,200 kWh.

Our IE5 solution

1 compressor was converted to variable speed with a 400 kW Dyneo**+** synchronous solution, consisting of Powerdrive MD2 and PLSHRM motors. Maximum speed was increased to 3,600 rpm, providing extra capacity and allowing removal of one of the two 315 kW fixed speed motors. The slide valves are now only used when starting and remain fully open during operation thus significantly limiting wear. The new arrangement reduced energy used annually down to 1,987,200 kWh .

Benefits

In addition to the 648,000 kWh savings, cutting electricity costs by over 45,000 USD per year and CO_2 emissions by 35 tons, the maintenance budget has been significantly reduced. Overall the return on investment has been evaluated to be much lower than one year and the decision was made to duplicate the system in other plants of the group.

Maximizing energy efficiency with extruders

Extrusion

Screw rotating extruders are widely used in the plastics industry but are also operating in other industries such as rubber, food, feed and powder coating, etc.

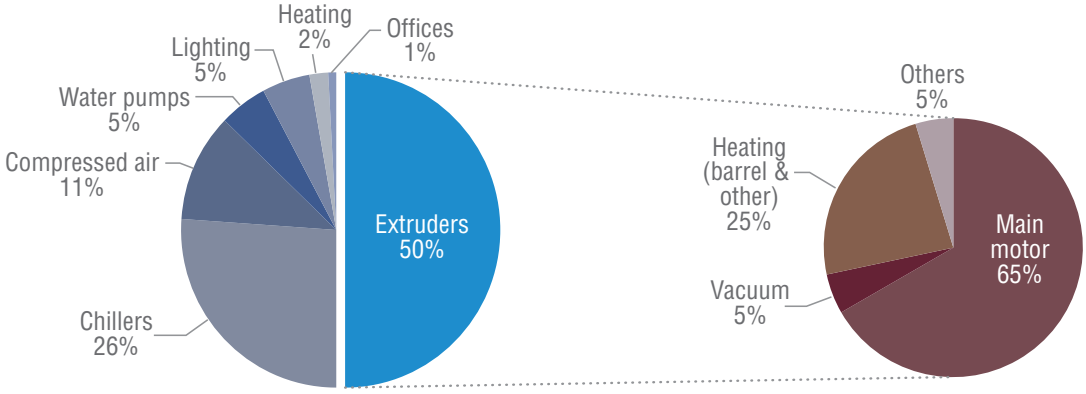
The plastics industry is highly dependent on competitive energy and raw materials. In Europe, the plastics industry calls policy-makers to joint action for sustainable growth, one of the first recommendations has been to ensure more competitive energy costs.

About 50% of plastic volume is transformed by extrusion. In a typical extrusion operation, about **1/3 of energy consumption** is related to the motors.

Historically, DC technology was mainly used for variable speed performance but the latest progress in AC control led to a technology shift. Efficiency is now an important consideration and recent energy savings policies encourage DC to AC system conversion on existing extruders. Such retrofit also significantly reduces maintenance costs.

Energy operators generally penalize manufacturing sites with low power factors, end-users may have no options other than paying significant penalties or modifying their installations with costly capacitor banks.

Induction and permanent magnet solutions result in a high power-factor compared to DC systems.



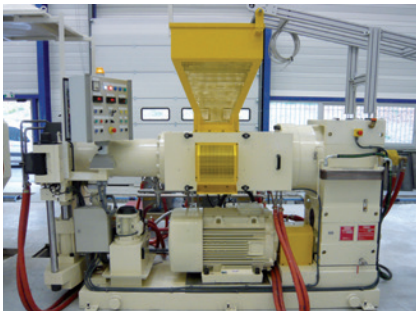
Energy distribution across a typical extrusion site

Case study: manufacturer of plastic film for the packaging industry

Stretch film products are made by a cast extrusion process. With over 150 extruders operating in 5 strategically located manufacturing facilities, the company is a leading supplier for the retail and distribution plastic bag market. The company's goal is to to reduce greenhouse gas emissions more than 3% per year.

Challenge

The manufacturer identified extruder motors as major consumers of power and engaged in an energy savings action plan. After conducting benchmark tests on the different options available, the company decided to switch existing units from DC to AC permanent magnet technology and to implement this high efficiency solution on new units.



Former installation

50 x DC motors & drives, from 15 to 400HP. Units were run continuously 24/7. An extruder not being dedicated to the manufacturing of a single type of product, motors are used in a combination of loads and speeds (generally from 40% to 90% of nominal values).

Our IE5 solution

50 x Dyneo**+** solutions, consisting of 1,800 rpm LSHRM IP55 motors + Unidrive M inverters, offering top efficiency performances all over the load/speed ranges. This AC variable speed solution also permitted reactive power savings resulting in a reduction in penalties from the energy supplier.

Benefits

The energy savings are estimated at 2,300,000 kWh/year, which is about 185,000 USD/year. In addition, the manufacturer realized significant maintenance savings, leading to a return on investment of less than 12 months.

Maximizing energy efficiency with Grinders

Grinding

Grinders are used heavily in industries such as the feed industry.

The compound feed industry is a big energy consumer. In Germany or France, the overall electricity consumption of the compound feed industry is about 1,200 GWh/year.

Raw materials represent the main cost of the final product, and energy is a major variable of operational cost for feed mills. On average electricity accounts for 60% of total energy used, with 90% of electricity consumption being related to motors.

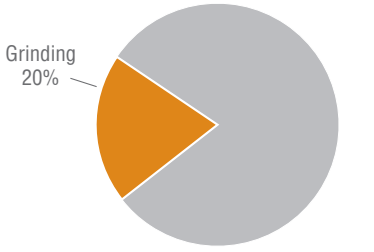
Grinding is one of the most energy intensive operations in the feed industry.

Focus on grinding:

Feed production is generally organized as a pre-grinding or pre-dosing process. When pre-grinding, the raw materials grinding operation is maximized and grinders are running «no load» for only 20% of the time. For the pre-dosing process, the mixture grinding operation is split into small batches. Grinders, usually hammermills, are running «no load*» during dosing and pre-mixing operations, for about 50% of time, making the process particularly energy consuming.*

**«No-load» means the grinder is running with no mixture inside. It usually requires about 10% of nominal motor power to run the grinder rotor.*

Feed mill energy consumption



Optimizing a grinding system by changing its configuration will save you around 20% on energy bills

	Before optimization	After optimization	Benefit
Grinder Main power range from 132 to 315 kW	Mostly 2 speed motor, occasionally fixed single speed	Synchronous package to get the highest efficiency over speed & load operating ranges	Process optimized during no-load operations, the motor speed can be reduced or let as free wheel + flying restart if the load arrives before stop
Fan Main power range from 15 to 55 kW	Mostly fixed speed motor + belt & pulley coupling + mechanical flow adjustment	Replacing IM with PMSynRM package converting to direct drive eliminating pulley & belt	Speed regulated with crusher speed and load. > 50% estimated energy savings
Feeder Main power range from 0.75 to 2.2 kW	Mostly geared-motor (worm gears)	Bevel gear (~95% efficiency) + a drive to the system	Motor speed is regulated with grinder load

Case study: grinding animal feed

A leader in animal feed producing 130,000 t per year, saw energy as a key consideration, both in terms of mastering consumption and in terms of operating expenditure.

For that reason, the customer identified levers for energy savings and implemented changes.

Challenge

Prior to the changes, a full energy audit was carried out over one month to evaluate the real operating conditions and associated energy consumption of a grinder and its fan.

Former installation

180/220 kW two speed motor fitted on grinder

37 kW fan: the fan was run fixed speed with a 3 position output louver

The audit showed the grinder was operated 15% of the time at low speed, 35% at no load (during the pre-mixing process) and 65% at average load when loaded (the load depends on the seed processed).

Our IE5 solution

The grinder two speed motor and the fan motor were converted to variable speed using synchronous motor technology. The opportunity was taken to increase the size of the grinder to 340 kW, to provide additional production capacity.

Benefits

After the changes, a new audit was carried out on the installation during the same month of the following year (to be as close as possible to the same operating conditions). 20% energy savings were demonstrated, bringing consumption down by 1.4 kWh per ton produced (over 182,000 kWh saved yearly). Significant improvements were also noted in productivity (fewer grinder stops), quality (fine tuning of speed) and maintenance (less balancing of hammer wear by changing grinder direction). Overall, it has been evaluated that return on investment took less than one year.

Maximizing your energy in any other application

Many other applications are candidates for saving energy

Material handling & conveyors

In material handling, small conveyors are mainly fitted with worm gear motors. This technology offers a strong cost advantage. Unfortunately its lack of efficiency (below 70% with gear ratio above 30:1), significantly increases operating costs.
One easy way to make additional savings is replacing worm technology with bevel (95/97 % efficiency).
A complete geared motor with variable speed solutions must be considered since the speed and load vary on conveyors. Adapting the speed to the load on the belts increases flexibility and productivity and reduces operating costs.

Aerators-blowers

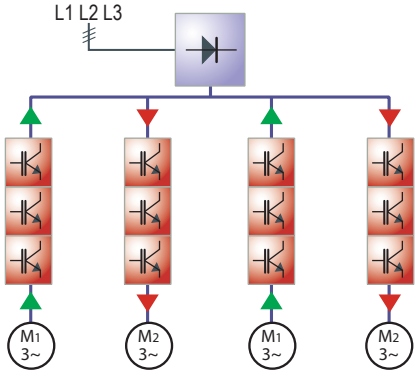
A waste water treatment plant uses an average of 50 to 60 kWh/inhabitant/year of electricity, making energy savings an easy way to reduce operating costs.
Because of wide variation in water usage, waste water treatment plants operate at partial load most of the time.
Aeration averages over 50% of the energy used in a waste water treatment plant, (in some plants it may even reach 80%) . Therefore it is a key target in implementing highly efficient solutions.
Whether it is fixed speed surface aerators or blowers for diffused aeration, there are tremendous savings possible from converting to variable speed. The use of synchronous technology will guarantee ROI in between 12 and 24 months.
With positive displacement blower technology (also known as twin lob or Roots), the wide speed range of permanent magnet technology allows direct drive on the blower. Meanwhile, elimination of pulley and belt transmission provides an additional 3 to 5 pts of efficiency for the system, and reduces maintenance.

Hoisting

In any application with hoisting, such as cranes or elevators, half of the time when the load is moved down, a significant amount of energy is generated. When driven through a variable speed drive (VSD) using 6 pulse technology, this energy must be evacuated in braking resistors thus being wasted. Using a regenerative VSD provides the capacity to feed this energy back to the power supply generating savings.

Cycled high inertias - winders/unwinders

With high inertia applications such as centrifuges, decanters, and separators, a lot of energy is used to accelerate the load while a lot is generated during deceleration; especially when productivity requires short cycles. As for hoisting, using a common VSD architecture will lead to wasting the energy produced during deceleration in big size braking resistors and drawing the energy needed for acceleration. Regenerative VSD drive can also be the solution for saving this energy but, in the event of several of these applications, there is a more cost effective solution. It consists of using a modular drive system with common DC bus to feed every single motor through an inverter. The saving is produced by the sequencing of the complete system where a decelerating machine provides the energy to an accelerating machine.
The same principle applies to process lines (metal, paper…) where the unwinder at the beginning of the line can provide energy to the winder.



DC bus system with 6 pulse rectifier

The highest energy efficiency solutions on the market

The best offer on the market

Whatever your need is, we have the right solution. The solution, comprising drives, motors, gears, soft starters and engineering services, delivers major energy savings and ensures compliance with the latest efficiency legislation.

Products are designed to the highest standards of reliability in order to reduce downtime. All automation products have been designed and tested as a package, delivering maximum compatibility with minimum effort, saving both time and cost in system build, integration and maintenance. All products are sourced from a single supplier, maximizing ease and speed of procurement.

Part of this offer, Dyneo+, is a reluctance assisted permanent magnet solution providing the highest motor and drive package efficiency available on the market.

Motor & drive technology: a complete offering

Product offering

AC drives for integration in cabinets	 Powerdrive F300	**IP20 variable speed drive offering optimum energy efficiency and flexible functionality** • 1.1 to 2,800 kW / 1.5 to 4,200 hp • 6, 12 and 18 pulses and AFE (Active Front End) • PLC functionality • Easy and flexible panel mounting with permanent magnet motor control
	 Commander C Unidrive M	**A value drive for a flexible machine integration through communications** • 0.25 to 110 kW / 0.33 to 150 hp • Quick & easy to install • Reduced machine downtime • Enhanced productivity through easy integration
Ready to use AC drive solutions available in wall mount or free standing	 Powerdrive MD2	**IP21 or IP54 high power variable speed drive** • Up to 250 kW available in wall mount • Above 250 kW free standing cabinet • Powers up to 2,800 kW / 2,000 hp • 690 V power supplies, 200 to 1,600 kW / 300 to 2,000 hp • Liquid cooling, 132 to 1,600 kW / 200 to 2,000 hp • Active Front End, 45 to 1,600 kW / 60 to 2,000 hp
Dyneo+ Synchronous motors combining reluctance and permanent magnet	 Dyneo+	**Super premium reluctance permanent magnet motors** • 11 to 500 kW / 15 to 750 hp • 1500 to 6000 rpm • IP55 or IP23 • IE5 super premium efficiency • Compact or interchangeable ranges • Aluminium or cast iron
IMfinity® induction or geared motors	 IMfinity®	**High, premium and super premium efficiency fixed and variable speed motors** • 0.06 to 1,800 kW / 0.8 to 2,500 hp • IP55 or IP23 • Cast iron or cast aluminium housing • Non IE, IE2, IE3, IE4 • Derivative ranges (ATEX, nuclear, high temperature, liquid cooled, and customized geared motor versions)
Soft starters	 Digistart D2/D3	**High technology soft starters use new adaptive acceleration technology for ultimate control** • Power supply 110 to 210 VAC or 220 to 440 VAC • Frequency 45 to 66 Hz • Soft start & stop solution for fixed speed induction motors • Integrated bypass • High flexibility. • 23 to 1600 A
Software		**Basic & customized software** • Intelligent pump control with anti-ragging solution • Duty assist solution software to control pump in parallel • Customized software for specific requirements

Rely on our energy savings expertise

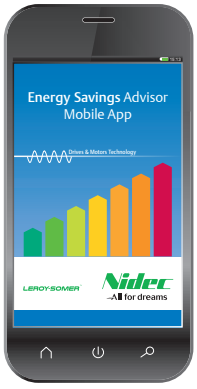
Energy Savings Advisor

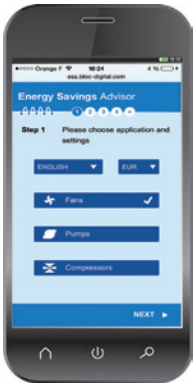
A powerful tool to estimate your energy savings
We have developed a simple but powerful interactive app that allows you to quickly estimate energy and cost savings when using our high efficiency motor and drive solutions.

Perform customized analysis
Our Energy Savings Advisor app enables you to compare various scenarios, taking into account your specific requirements, and to show the expected savings for your applications. A report and results are instantly sent by email.

Request our expertise
For a more detailed analysis, you can send the report along with any questions to our experts via the app.
One of them will get back to you shortly to study and answer your specific needs.

Get free access to the app
This app is freely accessible and optimized for mobile use. To directly access the Energy Savings Advisor app with your smartphone or tablet, simply scan the QR-code.

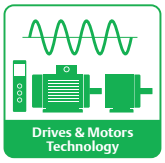


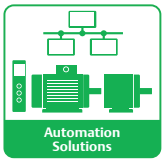


Count on our expertise from diagnostics to turn-key solutions and maintenance

Energy Audits

- Pre-diagnostics (identifying main sources).
- Energy audit (gathering information and measuring electricity consumption).
- Report (measuring, suggesting and calculating achievable yield and ROI).
- Provide turnkey, high-yield solutions.
- The Energy Savings Advisor app performs a customized analysis of motor and drive energy consumption.





Complete Offering

- IMfinity® high premium and super premium efficiency induction motors IE3, IE4.
- Dyneo+ best-in-class efficiency (IE5) reluctance permanent magnet motors.
- Geared motor execution for low speed, high torque applications.
- Unidrive M, Powerdrive and Commander C, standard and customized drives.
- Scalable automation solutions – from small machine automation projects up to complete automation and electrical turnkey solutions.
- High performance soft starter range.
- Express availability: an offer to deliver products with a guaranteed short lead time.

Installation & Commissioning

- Accredited personnel ensure reliability and safety of equipment.
- Installation in compliance with local technical regulations and safety standards.
- Onsite commissioning.
- Extended system guarantee.
- Installation and maintenance .

After Sales

- Emergency services: 24/7 telephone and web support, onsite technical assistance, express round-the-clock delivery of products or spare parts and urgent repairs.
- Assembly centers for ongoing maintenance work (replacement, retrofit and upgrades).
- Maintenance contracts.
  Services are optimized on a country-to-country basis, so please refer to your local sales contact for full details.

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Nidec

All for dreams

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