Energy efficiency.
A solution.

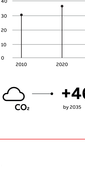
Pressures to reduce energy consumption and lower carbon dioxide emissions come from everywhere. The simplest way to address this challenge is to seize the opportunities for energy reduction that come from **using energy more efficiently**.

Using ABB's variable speed drives to intelligently control motors increases energy efficiency. This has enormous **positive financial, operational** and **environmental** implications.

The world's demand for energy will not go away

Globally, **demand for electricity will grow faster** than for any other form of final energy. Thus, emissions will keep rising, unless we **start doing something different**.

World energy demand
(in million tonnes of oil equivalent, Mtoe)



+47%
2035

Energy-related CO_2 emissions
(in gigatonnes)

CO_2 **+46%**
by 2035

World electricity consumption
(Rise in electricity demand by 2035)

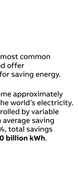
+90%
by 2035

The real numbers behind the challenge

Industries consume about **40%** of all electricity and about **40%** of all electricity is produced by coal.

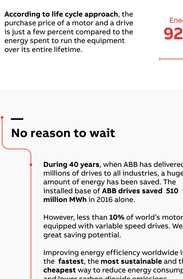
- **Industry**
  40%
  - Residential **28%**
  - Services **24%**
  - Other **6%**
  - Transport **2%**

- **Coal**
  41%
  - Gas **22%**
  - Nuclear **13%**
  - Other **6%**
  - Oil **5%**
  - Other **3%**
    (wind, solar, bic)



Motors consume about 28% of the world's electricity.

An intelligent motor control method can help in solving the energy challenges we all face



Variable speed drives regulate the speed of a motor and **can reduce energy consumption by as much as 30% to 50%** in many applications and in extreme cases by as much as by **90%**.

Let's look at the pumps

Pumps are one of the most common motor applications and offer the biggest potential for saving energy.

Pumps annually consume approximately **10%** or 1,850 TWh of the world's electricity. If all pumps were controlled by variable speed drives – with an average saving potential of about 40%, total savings could be as vast as **740 billion kWh**.

Think about this:
176

An **average coal-fired power plant** with a 500 MW power output generates **4.2 TWh of electricity**. The saving achieved by controlling pumps intelligently with variable speed drives would replace **176 coal-fired plants**. The CO_2 emission savings would amount to **592 million tons**.

Emission factor 0.8 kg/kWh.

It pays back

The payback time for using variable speed drives **is very short**, and the return on investment can come **within months**.

According to life cycle approach, the purchase price of a motor and a drive is just a few percent compared to the energy spent to run the equipment over its entire lifetime.

Energy	Purchase and installation	Maintenance
92%	**5%**	**3%**

No reason to wait

During 40 years, when ABB has delivered millions of drives to all industries, a huge amount of energy has been saved. The installed base of **ABB drives saved 510 million MWh** in 2016 alone.

However, less than **10%** of world's motors are equipped with variable speed drives. We have great saving potential.

Improving energy efficiency worldwide is the **fastest**, the **most sustainable** and the **cheapest** way to reduce energy consumption and lower carbon dioxide emissions.

Please visit us at abb.com/drives

Savings
510 million MWh
in one year

Energy saved with ABB's variable speed drives

- The installed base of ABB drives saved about 510 TWh in 2016, equivalent to the consumption per year of more than 125 million households in EU.
- If 510 TWh would have been generated by fossil fuel powered electricity plants, ABB drives reduced CO_2 emissions in 2016 by about 410 million tons, corresponding to the yearly emission of more than 100 million cars.

CO_2 emissions reduced
410 million tons
in one year

Sources:
US Department of Energy
International Energy Agency (IEA)
Bloomberg New Energy Finance
European PV Industry Association (EPIA)
International Energy Agency (IEA)
OECD Factbook 2013
C. Breyer and A. Gerlach.

www.sandia.gov/~jytsao/Solar%20FAQs.pdf
World energy outlook 2012
www.about.bnef.com/brief-news/clean-energy-investment-fell-11-as-governments-cut-subsidies/
www.epia.org
Medium-term renewable energy market report 2012, trends and projections to 2017
www.oecd-ilibrary.org/economics/oecd-factbook-2013_factbook-2013-en
"Global overview on grid parity". Published in Progress in Photovoltaics: Research and applications, Feb. 2012 :