

The background of the entire slide is a photograph of a body of water, likely a lake or river, with tall reeds in the foreground. The sun is low on the horizon, creating a warm, golden glow and reflecting on the water. The Siemens logo is positioned in the top left corner.

SIEMENS

[siemens.com/mobility](https://www.siemens.com/mobility)

Siemens locomotives

Sustainability on track

Our promise and commitment:

Global leader in green technologies



As a global technology company, we feel a shared responsibility – a commitment to help make the world a better place through our expertise and solutions.

We all agree on the urgency of protecting our planet and conserving the precious resources on which people, animals, and plants rely for their livelihood. For Siemens, these concerns are a call to duty. We see economic growth, social responsibility, and environmental protection as equal considerations in global free trade.

How can we use our natural resources effectively? How can we make a lasting contribution to environmental protection? These same questions drive us in the development of our locomotives. Rail is the most environmentally friendly mode of transport. But that alone is not enough. Our locomotives are designed

to be cost-effective for our customers while leaving a light environmental footprint – going above and beyond current regulations.

That's why we've invested in green production facilities that rely on environmentally friendly materials and produce locomotives that are up to 98 percent recyclable. In 2012, we were named Supersector Leader in the Dow Jones Sustainability Index and also won the top spot in Industrial Conglomerates for the sixth year in a row. We have delivered on our pledge to become the global leader in green technologies through our Environmental Portfolio.



Up to 98 % recyclable

Vectron – a model for sustainability

Green and mean: The new generation of Vectron locomotive is a model in its class. Development has benefited from numerous interviews with train operators and a wealth of experience with over 1,600 Eurosprinters and Eurorunners in operation. The Vectron sets new standards in passenger and freight transport.

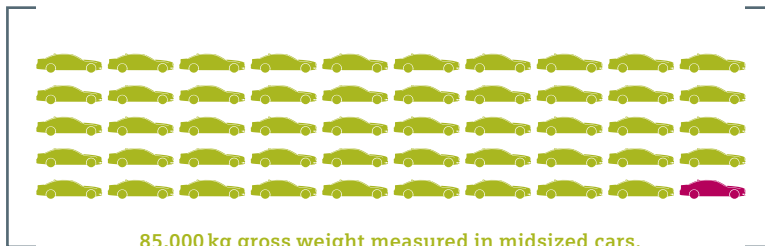
But its outstanding flexibility and efficiency are just the beginning – the Vectron is truly in a class of its own when it comes to sustainability. That begins in the production facilities, which are designed for energy efficiency, and continues with a consistent green theme of environmentally friendly raw materials, converters

with water-cooling, and transformer coolants made with biodegradable ester.

The Vectron unleashes its full green potential when it hits the tracks. It meets even the strictest emission guidelines for pollutants, particulate matter, and noise. The disc brakes allow for low-noise braking all the way to a standstill. The regenerative braking system can also produce energy savings of up to 25 percent, depending on the route topology. The Vectron continues to show its green spirit even at the end of its lifecycle: After many years of successful operation, almost nothing heads to the landfill – thanks to a recyclability of 98 percent.

Green from start to finish:

With a recyclability of 98 percent, a retired Vectron electric locomotive weighing 85 t is reduced to only 1,700 kg of non-recyclable waste – the equivalent of a mid-sized European car.



1,700 kg of residual material

Provides energy to over 20,000 New York consumers

America's cutting edge

America is a country of wide open spaces – and the innovative spirit of this country is complemented by one of the world's leading rail networks.

The Amtrak ACS64 is based on the Vectron and Eurosprinter – adapted for the American market. It offers the efficiency one expects from a Siemens locomotive coupled with green technology. The ACS64 feeds energy back into the grid while braking.

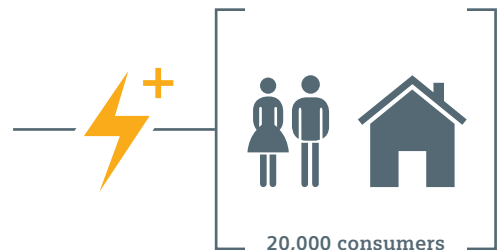
For railroad operator Amtrak, this means a more cost-effective fleet and up to 300 million dollars in energy savings over a 20-year lifecycle. This also means a significant reduction in CO₂ emissions for a lighter carbon footprint.



The Amtrak ACS64 can feed energy back into the grid while braking.



The 70 locomotives supply over 20,000 New York consumers.



Saves the atmosphere from 2,580 metric tons of CO₂

Australia's energy-saver

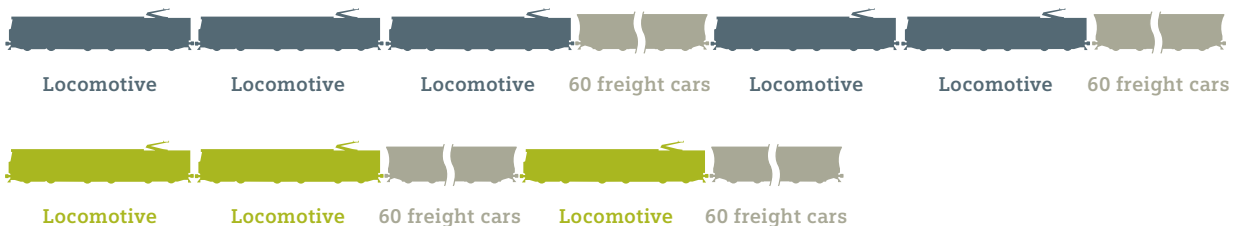


*From five down to three:
The 3800 series freight locomotives are so powerful that only three are needed to pull coal transports weighing 13,000 metric tons.*

Australia also boasts wide open spaces. Top performance and ironclad reliability are an absolute must when traversing such distances. Queensland Rail represents the state of the art – as a railroad and as a steward of the environment. The new 3800 series electric freight locomotives boast traction of 4,000 kW. This means that three locomotives can pull coal transports weighing 13,000 metric tons – compared to the five previously required. This yields energy savings of 1,050 MWh per year. With the current energy mix in Australia, that corresponds to a reduction in CO₂ emissions of 820 metric tons annually.

That's not all: By modernizing the 3100/3200 series models – also for Queensland Rail – we were able to bring 60 electric freight locomotives to the performance specifications of the current 3800 series and both increase their availability and extend their useful life another 20 years.

Installing regenerative braking systems in all locomotives lets them feed their braking energy back into the grid. Using this option makes it possible to save another 2,250 MWh. This saves the customer money and reduces CO₂ emissions by another 1,760 metric tons annually.



Saves the energy of 150,000 households with each run

China's energy miracle

When it comes to energy savings and environmental conservation, large projects promise the greatest successes – that's true in China as well. A typical example is the coal transports from the Datong mining district across a 620 km long decline to Qinhuangdao, handled by HXd1 electric twin locomotives from Siemens.

The HXd1 has made possible for the first time in China to pull coal transports weighing in excess of 10,000 metric tons. Since the HXd1 uses double traction, each train can carry 20,000 metric tons of coal with fewer locomotives and using much less energy.

The latest HXd1 is able to recover energy as it brakes, producing savings of 33 MWh or 25 percent per train on each round trip. This corresponds to the energy needs of about 150,000 Chinese households – and keeps about 29 metric tons of CO₂ out of the atmosphere per run.



China's energy miracle, the HXd1:
It saves some 25% and 29 metric tons of CO₂ with each run.



Siemens AG
Infrastructure & Cities Sector
Rail Systems Division
Nonnendammallee 101
13629 Berlin, Germany
locomotives.mobility@siemens.com

© Siemens AG 2013
Printed in Germany
HL 13078141 176835 DB 09130.5
Dispo 21715 c4bs 1423
Order No.:
A19100-V620-B319-V2-7600

Vectron®, Eurosprinter®, Eurorunner®
and Railcover® are registered trade marks
of Siemens AG.

The information in this document contains
general descriptions of the technical options
available, which do not always have to be
present in individual cases. The required
features should therefore be specified in
each individual case at the time of closing
the contract.