



COOPERATION IS CRITICAL IN BOOSTING WIND

# An Electrifying Start

A happy marriage of energy supply and demand — a growing fleet of electric and hybrid cars energized by wind mills in the North Sea and solar panels along the Mediterranean basin — is set to transform European transportation over the next decade.

Driving the transformation are freshly signed multinational agreements to capture, pool and transmit the generating power of ocean-borne winds, combined with regulations, taking effect in 2014, that require cleaner-burning automobile engines across the 27 states of the European Union.

This cooperative approach advanced by the EU addresses several of the continent's pressing problems: air pollution from an overreliance on coal-generated electricity, precariousness of petroleum supplies, and lackluster economic growth that undermines the continent's ability to defend itself and project its values.

"Putting our energy system on to a new, more sustainable and secure path may take time but ambitious decisions need to be taken now," EU Energy Commissioner Günther Oettinger announced in November 2010. "To have an efficient, competitive and low-carbon economy we have to Europeanise our energy policy and focus on a few, but pressing, priorities."

A large part of that policy is the implementation of the "Euro 6" regulations aimed at reducing tailpipe emissions starting in 2014. Euro 6 is widely seen as a way to steer automakers towards electric cars and away from the diesel cars that make up close to half of all European auto sales. Europe's diesel car industry isn't going away, but emissions reductions are compelling large manufacturers such as Mercedes, Volvo, Peugeot and Volkswagen to come up with diesel-electric hybrids to satisfy regulators. EU ministers agreed in 2010 that although gasoline and diesel engines "will remain dominant in the short- and medium-term," electric cars were a "highly promising ultra-low-carbon" technology that would reduce the EU's reliance on foreign fossil fuel.

"One of the big things in Euro 6 is the relatively harsh penalty on diesel," Colin Couchman, an analyst for London-based IHS Automotive, told Bloomberg news agency in late 2010. The new rules require that engines release 56 percent less nitrogen oxide, a reduction few diesel engines could accomplish in 2010. Automakers say strengthening that anti-pollution law will raise manufacturing costs, but it's still unclear how much of the cost will be passed to consumers.

Europeans are deliberating on how to standardize outlets

and charging stations, setting off a race to see whether European, Asian or American standards will prevail. Speed of recharge is vital since most electric cars can travel only about 100 kilometers before they need to plug into an outlet. For sales of electric cars to become widespread, buyers can't afford to wait 8 hours for a household recharge. The gold standard is a half-hour recharge. In 2009 and 2010, countries such as Hungary, the Netherlands, Germany, Portugal, Croatia and others set up prototypes of what they hope will be national car-charging networks.

In October 2010, Portuguese Energy Secretary Carlos Zorrinho announced the availability, starting in 2011, of a system of charging stations that will grow to 1,300 locations in 25 towns across the country. "It will be possible to go through the whole country without problems of charging electric vehicles," Zorrinho told Reuters. Hungary reportedly opened its first public electric car refueling station in Székesfehérvár in September 2010. In May 2010, the Netherlands opened one of the continent's first fast-charging stations in the town of Leeuwarden.

At the 2009 Frankfurt Auto Show, Renault proposed another way to overcome the limited range of purely electric

cars. A continent-wide battery swap program, modeled on old-fashioned stage coaches that required a change of horses at predictable intervals, would let car owners trade one leased battery for another when fuel ran low.

Electric cars by themselves are no panacea. Europe already produces an efficient alternative in clean diesel cars, which deliver stellar fuel economy without the grimy exhaust associated with previous generations of oil-burning engines. Peugeot, Europe's second largest carmaker, predicts it will sell 100,000 hybrid cars a year beginning in 2015. That number equals less than 5 percent of Peugeot's recent annual sales, which exceed 3 million cars and trucks.

And the price of electric cars, at least initially, could force them into the category of luxury vehicles without luxury accoutrements. Electric cars come with sticker prices nearly double that of similarly equipped economy cars. As German automotive executive Rainer Kurek told *Der Spiegel* in a story that appeared in December 2010, electric cars will ultimately succeed only as lower cost transportation, not as status symbols for wealthy greens. "Such cars satisfy only a very limited desire for mobility and are hardly well-suited to be expensive prestige items," Kurek told the magazine.



## SOLAR POWER IN EUROPE



Windmills turn in the breeze at Horns Rev 2, one of the world's largest wind farms, off of the west coast of Denmark. The project came online in 2009 and will help Europe reduce reliance on coal-fueled power generation.

# ELEKTRO TANKSTELLE

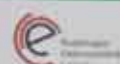


Alles da. Alles nah. Alles klar.

## DREWAG

IN KOOPERATION MIT

ELBEPARKDRESDEN



DREWAG



A driver plugs his electric car into a filling station in Dresden in August 2010. The German state of Saxony has installed battery recharging centers, part of what could become a continental car charging network.



IHS Automotive told Bloomberg it expected sales of electric and hybrid cars, sparked by the Euro 6 regulations, to approach 13 percent in 2020, up from about 0.1 percent in 2010. *Automotive News Europe* noted a less enthusiastic forecast by J.D. Power and Associates, which estimated electric and hybrids would carve out only 7 percent of sales in Europe over the next decade. Volkswagen chairman Martin Winterkorn was less smitten by what he called “electro-hype.” In a 2009 speech reported in Germany’s *Handelsblatt*, he predicted electric cars would total less than 2 percent of worldwide sales in 2020 and that reports of petroleum’s impending demise have been greatly exaggerated.

When it comes to reducing pollution, electric cars are only as good as the type of electricity that fuels them. For example, in Poland, which gets most power from coal, electric cars won’t ease pollution as much as they would in France, which gets most electricity from emissions-free nuclear power. That’s where wind and solar power enter the picture. The EU has ambitious goals to have renewable energy provide 20 percent of member states’ power in 2020 and 50 percent by 2050.

Wind has been the best bet in northern Europe, where solar power generation suffers from the region’s frequent cloud cover. In December 2010, 10 countries announced an agreement to create a North Sea “supergrid” to collect and share wind-driven power. The countries are Germany, France, the United Kingdom, Sweden, Denmark, Ireland, Holland, Luxembourg, Norway and Belgium. Recognizing the region’s wind potential, supporters talk of the North Sea as the Saudi Arabia of renewable energy. “Large-scale interconnection with our European neighbours is vital if we are to connect up our massive offshore wind potential and integrate it into European Markets,” Gordon Edge, an executive with British renewable energy trade association RenewableUK, said in December 2010.

More fanciful schemes are reaching farther abroad. Thirty European companies have formed a consortium, Desertec Industrial Initiative, that is trying to corral investors for a 400 billion-euro project to develop North African solar and wind farms. With luck, Desertec could build its first power plant by 2013. Supporters say it would be one of the largest infrastructure projects in history if it accomplishes its goal of providing 15 percent of Europe’s power by 2050. Desertec would capture the sun’s power in two main ways: mirrors to focus the sun’s rays to heat turbines and photovoltaic cells to capture solar energy more directly.

The project comes loaded with problems, not the least of which is the cost of North African solar power, quadruple that of power from coal and gas-fired generators. Desertec is lobbying for preferential treatment from the EU, mostly in the form of subsidies. Then there’s the difficulty of building support south of the Mediterranean. Although potential partners such as Morocco and Egypt praised the project, Algeria is leaning toward building its own solar plants, *Bloomberg Businessweek* wrote in September 2010. “European countries can develop faster and cheaper than Desertec a renewable energy supply from indigenous sources,” Hermann Scheer, German Bundestag member and head of the solar energy research group Eurosolar, told *Businessweek*. Spanish solar power holds promise, too, though a 2010 EU report said transmitting Spain’s excess electricity to France would require a tripling of power line capacity.

But if most of the projects succeed, green car and renewable energy manufacturers would create hundreds of thousands of jobs partly counterbalanced by jobs lost in industries that rely on traditional power generation. Technology developed in places such as Germany and France, including automobile charging stations and windmill blade innovations, is exportable to the EU’s eastern European and Central Asian neighbors. Furthermore, North African solar power ventures would require high levels of international cooperation, generating economic spinoffs beneficial to a less developed region that supplies many of Europe’s illegal immigrants.

Energy independence would grow. Natural gas used to fuel European electric turbines comes from Russia and Algeria, among other places. Petroleum to make gasoline and diesel fuel heads the list of exports from the Middle East and Russia. Clean, domestic supplies of fuel would snap some of the tethers that bind the EU to not-always-friendly regimes. As the European Wind Energy Association reported in 2010, wind-generating capacity expanded faster in 2009 than that of any other power source. Whether or not manmade carbon dioxide is the main driver of what some believe is global warming, a reduction in noxious emissions is good for society.

“It will take decades to steer our energy systems onto a more secure and sustainable path,” the European Commission proclaimed in November 2010. “Yet the decisions to set us on the right path are needed urgently as failing to achieve a well-functioning European energy market will only increase the costs for consumers and put Europe’s competitiveness at risk.” □