E Building plants is just part of the challenge. One of the drawbacks to CSP technology is that it works at maximum efficiency only in sunny, hot climates – and deserts tend to be distant from population centres. To supply Europe with 20% of its electricity needs, more than 19,300 kilometres of cables would need to be laid under the Mediterranean, says Gunnar Asplund, head of HVDC research at ABB Power Technologies in Ludvika, Sweden. Indeed, to use renewable sources of power, including solar, wind and tidal, Europe will need to build completely new electrical grids. That's because existing infrastructures, built largely for the coal-fired plants that supply 80% of Europe's power, would not be suitable for carrying the amount of electricity generated by the Sahara. Germany's government-run Aerospace Centre, which researches energy, estimates that replacing those lines could raise the cost of building solar plants in the Sahara and sending significant amounts of power to Europe to about $465 billion over the next 40 years. Generous government subsidies will be needed. 'Of course it costs a lot of money,' says Asplund. 'It's a lot cheaper to burn coal than to make solar power in the Sahara.'

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F Meanwhile, some companies are getting started. Seville engineering company Abengoa is building one solar-thermal plant in Algeria and another in Morocco, while a third is being built in Egypt by a Spanish–Japanese joint venture. The next step will be to get cables in place. Although the European Parliament has passed a law that aids investors who help the continent reach its goal of getting 20% of its power from renewable energy by 2020, it could take years to create the necessary infrastructure.

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G Nicholas Dunlop, secretary-general of the London-based NGO e-Parliament, thinks companies should begin transmitting small amounts of solar power as soon as the North African plants begin operating, by linking a few cable lines under the Med. 'I call it the Lego method,' he says. 'Build it piece by piece.' If it can be shown that power from the Sahara can be produced profitably, he says, companies and governments will soon jump in. If they do, perhaps airplane passengers flying across the Sahara will one day count the mirrors and patches of green instead of staring at sand.

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