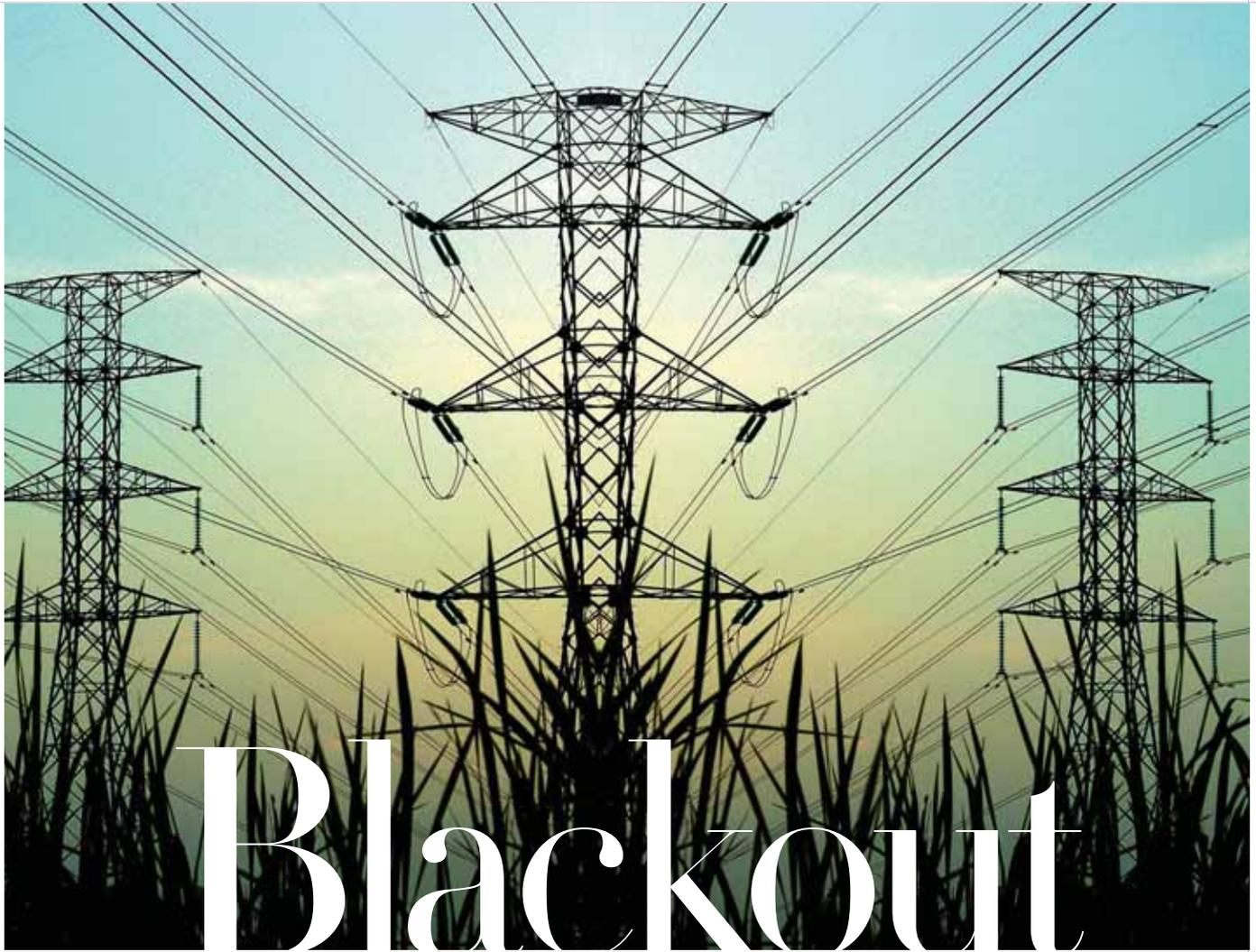


SECURING ELECTRICITY Bill Durodié, ASSOCIATE FELLOW, INTERNATIONAL SECURITY PROGRAMME, CHATHAM HOUSE.

COORDINATING THE HOMELAND DEFENCE PROGRAMME AT THE NANYANG TECHNOLOGICAL UNIVERSITY, SINGAPORE FROM SEPTEMBER.



Blackout

Providing power for all the equipment regarded as essential in a wired world draws electricity across international borders.

Keeping the supply safe is a major security issue. But how can societies make this a priority, when saving energy has become the issue of the day?

IN RECENT YEARS THERE HAVE BEEN A NUMBER OF high-profile electrical power failures across the developed world. In August 2003, the largest blackout in North American history affected some fifty million people from New York City through to Ontario in Canada. Two weeks later, millions of London commuters were caught in a similar incident that affected the southeast of England. A month after that, and just a few days after an emergency that engulfed the south of Sweden and Denmark, the whole of Italy and parts of Switzerland suffered one of the most serious blackouts for twenty years.

Apart from the evident economic cost, human lives and wellbeing are put at risk, not just for those acutely dependent on electrical equipment, such as patients in intensive care units, but further afield through the progressive failure of other critical systems, from transport and communications to the supply of water and sewage disposal. Little wonder that the grid is a key component of any critical national, and international, infrastructure. In the aftermath of September 11 2001, measures were put in place to guard power stations and substations against any new threats.

It is easy to assume that much of what is required to



ensure the safe and efficient operation of such a system is simply technical. After all, the provision of power, from extraction through generation to transmission and distribution, is largely undertaken by engineers. But this would grossly underestimate the tightly interwoven physical and social networks the grid represents. These encompass social and political pressures, as well as technical and commercial ones. Keeping the lights on is in everybody's interest, even if few are directly involved.

Researchers from the International Security Programme at Chatham House have become involved in a European Union Leonardo da Vinci funded project to explore the safeguarding of electricity supplies. The project, called UNDERSTAND, is led by the Swedish Energy Agency, and focuses on developing means to prevent cascade effects across borders during blackouts. As European nations become more interdependent for their energy needs, such problems are more likely, with dramatic consequences for all concerned.

Cross-border cooperation requires a shared set of goals and beliefs. These may seem evident, but without being explicitly stated or developed in unison, tensions can arise. For instance, despite the recent emphasis on securing the grid against possible terror attacks, the most likely sources of failure, apart from adverse weather, comes from contact with trees and wildlife. Such mundane issues may not suit grandstanding politicians and officials, but it is precisely the ability to cope with the everyday, rather than the exotic, that ensures real resilience and recovery.

PRIVATISATION AND PRICE

Electricity cannot be effectively stored, so across vast systems, supply has to match demand second-by-second. In

the early twentieth century, much of the grid was organised on a local or regional basis. Subsequently this moved to a national level and more recently became international.

Since the 1990s, the trend to liberalise electricity supply and prices has imposed new, if sometimes conflicting, pressures on companies and transmission system operators, charged with ensuring that their product is both competitively priced and available to all possible users.

NEW ENVIRONMENT

Privatisation, whilst pushing the integration of systems across borders, has also made fragmentation within them possible. Outsourcing has been a major trend, not just for customer services, but system maintenance, monitoring and even planning. But, far from these narrow commercial pressures, as some see them, causing a growing disconnect between the system's operators and their consumers, the real sources of instability are the competing aims and values of those providers for whom ensuring supply is the priority, and those focusing on meeting a range of other targets.

Among the latter, some environmental objectives may, despite good intentions, prove to be the real source of difficulties. For instance, rather than increasing demand, today we are all encouraged to reduce our use of energy. As the authors of one of the project's key papers note, demand management implicitly devalues consumption and denigrates the role of those charged with ensuring supply. Besides sapping the enthusiasm of those in the industry who are now accused of despoiling the planet, an inevitable consequence is to prioritise areas other than provision.

The drive to cut greenhouse gas emissions has also led to a focus on so-called renewables – primarily wind and solar



energy. Irrespective of the relative efficiencies of these, the consequence has been to complicate the grid by introducing many more points of entry and sources of failure.

This decentralisation need not be irresolvable given sufficient resources, but a bigger problem is the inability of transmission system operators to turn such sources on and off. Hence a greater share of electricity generation now comes from sources whose input is less controllable, let-alone predictable.

Another environmental problem is establishing new rights of way for transmission lines through the countryside. This is not simply a planning issue, but has increasingly been influenced by a small yet vociferous lobby which proposes a link between proximity to power lines and cancer. Irrespective of the scientific evidence for their ideas, the fears have led to running existing systems to their physical limits, with damaging consequences as cables expand through heating, shorting on nearby trees which may not have been pruned on ecological grounds.

CELEBRATING SUPPLY

Those charged with operating, maintaining and developing the grid, need a range of skills beyond the technical and commercial. In an age when the celebration of major infrastructural systems and projects runs counter to the mood, their outlook and ambitions may become more limited. Supply targets, which once improved the quality of countless lives, can come to be seen as pointless. Yet, these individuals have

responsibilities to all constituencies in society, not just the most vocal or the more fashionable.

This project aims to develop tools to encourage coordination and communication between transmission system operators, which is clearly needed if we are to avoid cascade blackouts as systems become more interlinked.

Building trust and cooperation between engineers across borders requires not just financial support with adequate investment, or technical back-up through regular maintenance, but also cultural change by developing a clear and shared sense of purpose. This implies a celebration of the grid and its achievements, not a rejection of it.

A fully functioning system also needs public support and involvement. With growing concern about the possibility of a return to generating more electricity in nuclear plants, and when people seem happier taking part in a voluntary switch-off than demanding more power, this is a significant political task. It requires a clarity of purpose by operators and politicians, and a willingness to challenge public thinking, rather than pandering to it. This will need communication skills beyond those of a mission statement or a public relations campaign; a passion for a new enlightenment.

Some of these lessons; a focus on recovery from routine problems rather than catastrophic events, an appreciation of the social dimension of apparently technical issues, the need for greater clarity of purpose and to engage and challenge the public rather than merely communicating or adapting to their concerns, ought to be learnt by all concerned with resilience. By clarifying the extent to which a critical national infrastructure can be undermined through a confusion of numerous objectives, we hope to encourage debate about what the priorities should be.



Chatham House Events September 2008



SEPTEMBER 15 Does it Matter Who Wins? US Foreign Policy After the Election

Alex Lennon, Editor-in-Chief, *The Washington Quarterly*

SEPTEMBER 18 Britain's Armed Forces: Glorious Past, Uncertain Future

Sir Max Hastings, Former Editor, *The Daily Telegraph*

SEPTEMBER 18 A British Agenda for Europe - Launch of Report

Sir Stephen Wall, Chairman, Chatham House Commission on Europe

Chatham House has a worldwide reputation for furthering the understanding of international issues. An impartial research and membership organisation, independent of government and vested interests, it brings together people of all nationalities and from all walks of life.

Membership: +44 (0) 20 7957 5721

Meetings: +44 (0) 20 7314 3636

Conferences: +44 (0) 20 7957 5754

e-mail: contact@chathamhouse.org.uk