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# The Challenge of Energy Security in the 21<sup>st</sup> Century

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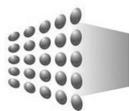
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# The Challenge of Energy Security in the 21<sup>st</sup> Century

**TRENDS OF SIGNIFICANCE**

EDITED BY  
**HOOMAN PEIMANI**



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*To my son, Justin*



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# List of Acronyms

|                 |  |
|-----------------|--|
| ASEAN           | Association of Southeast Asian Nations                           |
| ASEF            | Asia-Europe Foundation   |
| ASEM            | Asia Europe Meeting  |
| BB              | billion barrels  |
| bcm             | billion cubic metres   |
| bpd             | barrels per day  |
| CCS             | carbon capture and storage                                       |
| CO <sub>2</sub> | carbon dioxide   |
| CSP             | concentrating solar power  |
| EAEF            | EC-ASEAN Energy Facility Programme                               |
| EC              | European Community   |
| EEP             | Energy and Environmental Programme                               |
| EIA             | Energy Information Administration                                |
| ENVforum        | Asia-Europe Environment Forum                                    |
| EPIA            | European Photovoltaic Industry Association                       |
| EU              | European Union   |
| FAO             | Food and Agriculture Organization of the United Nations          |
| G-20            | The Group of Twenty Finance Ministers and Central Bank Governors |
| GECCF           | Gas Exporting Countries Forum                                    |
| GW              | gigawatt   |
| GWh             | gigawatt-hours   |
| GWII            | Global Water Intelligence  |
| HHI             | Hirschman-Herfindahl Index                                       |
| IDA             | International Desalination Association                           |
| IEA             | International Energy Agency                                      |
| IGCC            | Integrated Gasification Combined Cycle                           |

|          |  |
|----------|--|
| IPEEC    | International Partnership for Energy Efficiency Cooperation      |
| IRENA    | International Renewable Energy Agency                            |
| ITER     | International Thermonuclear Experimental Reactor                 |
| kW       | kilowatt   |
| kWh      | kilowatt-hours   |
| LNG      | liquefied natural gas  |
| m bpd    | million barrels per day  |
| MED      | multi-effect distillation  |
| MIT      | Massachusetts Institute of Technology                            |
| MMT      | million metric tons  |
| MSF      | multistage flash distillation                                    |
| MW       | megawatt   |
| MWh      | megawatt-hours   |
| MWp      | megawatt peak  |
| NDRC     | National Development and Reform Commission                       |
| NGCC     | National Gas Combined Cycle                                      |
| OAPEC    | Organization of Arab Petroleum Exporting Countries               |
| OECD     | Organization for Economic Cooperation and Development            |
| OPEC     | Organization of the Petroleum Exporting Countries                |
| PNG      | piped natural gas  |
| PV       | photovoltaics  |
| REN21    | Renewable Energy Policy Network for the 21 <sup>st</sup> Century |
| RO       | reverse osmosis  |
| R/P      | reserves-to-production   |
| SEB      | state electricity board  |
| STRACO2  | Support to Regulatory Activities for Carbon Capture and Storage  |
| TCM      | trillion cubic metres  |
| TW       | terawatt   |
| TWh      | terawatt-hours   |
| U.A.E    | United Arab Emirates   |
| U.K.     | United Kingdom   |
| U.N.     | United Nations   |
| UNFCCC   | United Nations Framework Convention on Climate Change            |
| U.S.A.   | United States of America   |
| U.S.S.R. | Union of Soviet Socialist Republics                              |
| VC       | vapour compression   |

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