

# Energy Devices – Bibliography

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## 1 Bibliography, further reading

Additional resources are available<sup>1</sup> online.

Please send further recommendations to [eric.switzer@gmail.com](mailto:eric.switzer@gmail.com).

### 1.1 General literature

- *Renewable Energy* by G. Boyle, *Energy Systems and Sustainability* by G. Boyle, B. Everett and E. Ramage, *Sustainable Energy: Without the Hot Air* by D. MacKay (available online<sup>2</sup>) and *Energy at the crossroads: global perspectives and uncertainties* by Vaclav Smil describe energy consumption (broadly), technology, and prospects for the future.
- *Plan B 4.0: Mobilizing to Save Civilization* by L. Brown (available online<sup>3</sup>), *Beyond Oil* by K. Deffeyes (petroleum geologist), *Hot, Flat and Crowded* by T. Friedman, and *Out of Gas* by D. Goodstein provide a contemporary picture of environmental, technological and resources challenges.
- *Megawatts and Megatons: The Future of Nuclear Power and Nuclear Weapons* by R. Garwin and G. Charpak is an excellent review of nuclear technology. *Plutonium* by Jeremy Bernstein describes the history of nuclear physics during WWII, focusing on the Plutonium path to the atomic bomb.
- *Mere Thermodynamics* by D. Lemons and *The Refrigerator and the Universe: Understanding the Laws of Energy* by M. Goldstein and I. Goldstein provide a high-level discussion of thermodynamics for the public.
- *Oil 101* by M. Downey is a no-nonsense, exhaustive discussion of oil.
- *Renewable Energy Policy* – P. Komor.

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<sup>1</sup><https://toaster.uchicago.edu/energy/index.php/Links>

<sup>2</sup><http://www.withouthotair.com/>

<sup>3</sup><http://www.earth-policy.org/index.php?/books/pb4>

## 1.2 Technical literature

- *Fundamentals of Renewable Energy Processes* by A. da Rosa (Lec. 4, 6, 7) is a great book that concisely satisfies almost any curiosity about the physics of energy technology.
- *Introductory Nuclear Physics* (K. Krane) and *Nuclear Physics: Principles and Applications* (J. Lilley) are standard nuclear physics textbooks at the advanced undergraduate physics level (Lec. 8). “Experimental production of a divergent chain reaction” – E. Fermi et al., 1952, Am. J. Phys. summarizes the CP-1 experiment at Chicago.
- *Electricity, Magnetism, and Light* by W. M. Saslow (Lec. 1, 2).
- *The Physics of Solar Cells* by J. Nelson and *Physics Of Solar Cells: From Basic Principles To Advanced Concepts* by P. Würfel are at the advanced undergraduate physics level. “Solar collector basics” by J. Richter in J. Ren. Sus. Energy (043112, 2009) describes the integrated radiation for various solar collector geometries. (Lec. 7)
- *Wind Turbines: Fundamentals, Technologies, Application, Economics* by E. Hau (Lec. 4).
- *Fuel Cell Fundamentals* – R. O’Hayre, S. Cha, W. Colella, F. Prinz.
- *The Feynman Lectures on Physics* – Feynman, Leighton and Sands (Lec. 1, 5).
- Two good summaries of the grid are provided by National Council on Electricity Policy, “Electricity Transmission: A primer”<sup>4</sup> and the UN report, “Multi-dimensional Issues in International Power Grid Interconnections”<sup>5</sup> (Lec. 3).

## 1.3 Reports and websites

- American physical society (2008), “Energy Future: Think Efficiency”.<sup>6</sup>
- *The world energy assessment* (UN/WEC publication).<sup>7</sup>
- “Reducing U.S. Greenhouse Gas Emissions: How much at what cost?” by McKinsey and Company.<sup>8</sup>
- “Unlocking energy efficiency in the US economy” by McKinsey and Company.<sup>9</sup>
- For a sense of future nuclear reactor designs, see the Idaho National Labs publication “A Technology Roadmap for Generation IV Nuclear Energy Systems”<sup>10</sup>. M. Dittmar

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<sup>4</sup><http://www.oe.energy.gov/DocumentsandMedia/primer.pdf>

<sup>5</sup><http://www.un.org/esa/sustdev/publications/energy/interconnections.htm>

<sup>6</sup><http://www.aps.org/energyefficiencyreport/>

<sup>7</sup><http://www.undp.org/energy/activities/wea/>

<sup>8</sup><http://www.mckinsey.com/clientservice/ccsi/greenhousegas.asp>

<sup>9</sup>[http://www.mckinsey.com/clientservice/electricpowernaturalgas/US\\_energy\\_efficiency/](http://www.mckinsey.com/clientservice/electricpowernaturalgas/US_energy_efficiency/)

<sup>10</sup><http://gif.inel.gov/roadmap/>

has also recently examined nuclear power and Uranium supplies in a four-part series: 1) “Chapter I: Nuclear Fission Energy Today”,<sup>11</sup> 2) “Chapter II: What is known about Secondary Uranium Resources?”,<sup>12</sup> 3) “Chapter III: How (un)reliable are the Red Book Uranium Resource Data?”,<sup>13</sup> 4) “Chapter IV: Energy from Breeder Reactors and from Fusion?”.<sup>14</sup> The series gives many citations to industry reports and data books.

- “Annual Report on U.S. Wind Power Installation, Cost, and Performance Trends: 2007” EERE/DOE<sup>15</sup> (Lec. 4).
- “Hydropower Resource Assessment” from Idaho National Labs.<sup>16</sup>
- “The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reduction” from ICF International<sup>17</sup> (Lec. 6).
- “Prosperity without growth” – Sustainable Development Commission.<sup>18</sup>
- “World Energy Outlook” by the IEA.<sup>19</sup>
- “America’s Energy Future”, reports by The National Academies.<sup>20</sup>
- There are a number of interesting reports about oil and refining. One out-of-the-way resource to read about oil refining is “Petroleum Refining Processes” in the OSHA technical manual, Sec. 4, Ch. 2.<sup>21</sup> Also the book *Oil 101* has a discussion of the steps and finished products. The National Petroleum Council has published a general report about energy and the industry, “Facing the Hard Truths About Energy”.<sup>22</sup> OPEC provides a library of publications and statistics.<sup>23</sup> NREL has a number of publications available online<sup>24</sup> that describe non-petroleum fuels. CERA also has an online research library.<sup>25</sup> A classic and controversial report on limitations of oil resources is “Peaking of World Oil Production: Impacts, Mitigation and Risk Management”, R. Hirsch, R. Bezdek, and R. Wendling.<sup>26</sup>
- Library of the Bipartisan Policy Center.<sup>27</sup>

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<sup>11</sup><http://arxiv.org/abs/0908.0627>

<sup>12</sup><http://arxiv.org/abs/0908.3075>

<sup>13</sup><http://arxiv.org/abs/0909.1421>

<sup>14</sup><http://arxiv.org/abs/0911.2628>

<sup>15</sup><http://www1.eere.energy.gov/windandhydro/pdfs/43025.pdf>

<sup>16</sup><http://hydropower.inel.gov/resourceassessment/index.shtml>

<sup>17</sup>[http://www.publictransportation.org/pdf/reports/land\\_use.pdf](http://www.publictransportation.org/pdf/reports/land_use.pdf)

<sup>18</sup>[http://www.sd-commission.org.uk/publications/downloads/prosperity\\_without\\_growth\\_report.pdf](http://www.sd-commission.org.uk/publications/downloads/prosperity_without_growth_report.pdf)

<sup>19</sup><http://www.worldenergyoutlook.org/>

<sup>20</sup><http://sites.nationalacademies.org/Energy/index.htm>

<sup>21</sup>[http://www.osha.gov/dts/osta/otm/otm\\_iv/otm\\_iv\\_2.html](http://www.osha.gov/dts/osta/otm/otm_iv/otm_iv_2.html)

<sup>22</sup><http://www.npchar truthsreport.org/>

<sup>23</sup><http://www.opec.org/library/>

<sup>24</sup><http://www.nrel.gov/vehiclesandfuels/npbf/publications.html>

<sup>25</sup><http://www.cera.com/asp/cda/public1/research/findresearchhome.aspx>

<sup>26</sup>[http://www.netl.doe.gov/publications/others/pdf/Oil\\_Peaking\\_NETL.pdf](http://www.netl.doe.gov/publications/others/pdf/Oil_Peaking_NETL.pdf)

<sup>27</sup><http://bipartisanpolicy.org/library>

- The European Wind Energy Association,<sup>28</sup> American Wind Energy Association,<sup>29</sup> and Wind-Works<sup>30</sup> have many publications available online.

#### 1.4 Compilations of data and data books

- The Energy Information Administration<sup>31</sup> (EIA) is a section of the DOE charged with compiling energy statistics.
- The International Energy Agency (IEA) compiles energy statistics<sup>32</sup> under the aegis of the OECD. For a summary, see their key statistics publication.<sup>33</sup>
- “Statistical Review of World Energy: 2009” from BP.<sup>34</sup>
- “Power Technologies Energy Data Book” from NREL.<sup>35</sup>
- “U.S electricity” by the EIA.<sup>36</sup>
- “Renewable Energy Annual 2007” from the EIA.<sup>37</sup>
- “Emissions of Greenhouse Gases in the United States 2008” from the EIA<sup>38</sup> ) and related EPA: “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007”.<sup>39</sup>
- “Buildings energy data book” from EERE/DOE.<sup>40</sup>
- “Biomass energy data book” from ORNL.<sup>41</sup>
- “Hydrogen data book” from PNL.<sup>42</sup>
- There are a number of summaries of transportation data. Oak Ridge (CTA) produces the *Transportation energy data book*<sup>43</sup> (Lec. 6). The Transportation Research Board (National Academies) provides a number of statistics by-mode.<sup>44</sup> RITA/US-DOT publishes the “Transportation Statistics Annual Report”.<sup>45</sup> EERE/DOE publishes the “Alternative Fuels and Advanced Vehicles Data Center”.<sup>46</sup>

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<sup>28</sup><http://www.ewea.org>

<sup>29</sup><http://www.awea.org>

<sup>30</sup><http://www.wind-works.org>

<sup>31</sup><http://www.eia.doe.gov/>

<sup>32</sup><http://www.iea.org/Textbase/stats/index.asp>

<sup>33</sup>[http://www.iea.org/textbase/nppdf/free/2008/key\\_stats\\_2008.pdf](http://www.iea.org/textbase/nppdf/free/2008/key_stats_2008.pdf)

<sup>34</sup><http://www.bp.com/productlanding.do?categoryId=6929&contentId=7044622>

<sup>35</sup>[http://www.nrel.gov/analysis/power\\_databook/](http://www.nrel.gov/analysis/power_databook/)

<sup>36</sup><http://www.eia.doe.gov/fuelelectric.html>

<sup>37</sup>[http://www.eia.doe.gov/cneaf/solar.renewables/page/rea\\_data/rea\\_sum.html](http://www.eia.doe.gov/cneaf/solar.renewables/page/rea_data/rea_sum.html)

<sup>38</sup><http://www.eia.doe.gov/oiaf/1605/ggrpt/>

<sup>39</sup><http://epa.gov/climatechange/emissions/usinventoryreport.html>

<sup>40</sup><http://www.btscoredatabook.net/>

<sup>41</sup><http://cta.ornl.gov/bedb/index.shtml>

<sup>42</sup><http://hydrogen.pnl.gov/cocoon/morf/hydrogen>

<sup>43</sup><http://cta.ornl.gov/data/Index.shtml>

<sup>44</sup><http://www.trb.org/>

<sup>45</sup>[http://www.bts.gov/publications/transportation\\_statistics\\_annual\\_report/](http://www.bts.gov/publications/transportation_statistics_annual_report/)

<sup>46</sup><http://www.afdc.energy.gov/afdc/fuels/index.html>

- The NREL Solar “Red Book”.<sup>47</sup> (Lec. 8)
- EPA eGRID (emission from the electrical power sector).<sup>48</sup>
- DOE Office of Electricity Delivery and Energy Reliability (many reports within).<sup>49</sup>
- The NNDA/ENDF nuclear cross section library.<sup>50</sup> (Lec. 7)

## 1.5 Talks and Websites

- LLNL energy and emission flow data.<sup>51</sup><sup>52</sup>
- Physics of Sustainable Energy (2008 APS conference), talks<sup>53</sup> and proceedings.<sup>54</sup>
- *Global Energy Perspective* by Nathan Lewis.<sup>55</sup>
- *Home Energy Saver* audit tool from LBL.<sup>56</sup>

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<sup>47</sup><http://rredc.nrel.gov/solar/pubs/redbook/>

<sup>48</sup><http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>

<sup>49</sup><http://www.oe.energy.gov/>

<sup>50</sup><http://www.nndc.bnl.gov/sigma/>

<sup>51</sup><https://publicaffairs.llnl.gov/news/energy/energy.html>

<sup>52</sup><https://eed.llnl.gov/flow/>

<sup>53</sup><http://rael.berkeley.edu/files/apsenergy/>

<sup>54</sup><http://proceedings.aip.org/proceedings/confproceed/1044.jsp>

<sup>55</sup><http://nsl.caltech.edu/energy.html>

<sup>56</sup><http://hes.lbl.gov/>