The Electrification of Russia, 1880–1926

Coopersmith, Jonathan

Published by Cornell University Press

Coopersmith, Jonathan.
The Electrification of Russia, 1880–1926.

For additional information about this book
https://muse.jhu.edu/book/46089
<table>
<thead>
<tr>
<th>Term</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academy of Sciences</td>
<td>159; move to Moscow, 145; and war efforts, 100. See also KEPS</td>
</tr>
<tr>
<td>&quot;Actor network,&quot;</td>
<td>10, 94–95, 137–38, 151–53, 164, 179, 185, 190, 194, 256</td>
</tr>
<tr>
<td>AEG</td>
<td>34, 38, 53, 86, 245</td>
</tr>
<tr>
<td>Aleksandrovsk</td>
<td>173, 186</td>
</tr>
<tr>
<td>Alekseev, N. M., Gen.</td>
<td>48</td>
</tr>
<tr>
<td>Alexander III, coronation of</td>
<td>19</td>
</tr>
<tr>
<td>All-Russian Central Executive Committee</td>
<td>126, 157, 222</td>
</tr>
<tr>
<td>All-Russian Conference of Communal Electric Station Managers</td>
<td>224, 226</td>
</tr>
<tr>
<td>All-Russian Electrotechnical Congress</td>
<td>14, 23–24, 34, 128; 8th, 178, 180–85, 187, 221, 248</td>
</tr>
<tr>
<td>All-Union Conference on Electricity Supply</td>
<td>248–50, 255</td>
</tr>
<tr>
<td>Alternating current (AC)</td>
<td>42, 46, 70</td>
</tr>
<tr>
<td>1-phase</td>
<td>50</td>
</tr>
<tr>
<td>3-phase</td>
<td>26, 34, 50–51, 53, 55–56, 58–59, 70–71; hydrostations, 83</td>
</tr>
<tr>
<td>struggles with direct current (&quot;battle of the systems&quot;), 50–51, 62</td>
<td></td>
</tr>
<tr>
<td>American Institute of Electrical Engineers</td>
<td>24, 124</td>
</tr>
<tr>
<td>Archangel</td>
<td>104</td>
</tr>
<tr>
<td>Army</td>
<td>16–22, 33, 56–57, 83, 199; Gerschenkronian substitute, 16; Special Commission to Supply the Red Army, 145; wartime hydropower, 112. See also GAU</td>
</tr>
<tr>
<td>ASEA</td>
<td>241–42, 244–45</td>
</tr>
<tr>
<td>Association of Industry and Trade</td>
<td>102, 115</td>
</tr>
<tr>
<td>Azneft</td>
<td>208</td>
</tr>
<tr>
<td>Baku</td>
<td>27, 46, 80; civil war in, 130; consumption, per capita, 73; electrification of, 58–59, 70; and NEP, 195, 208, 216, 218, 223; and oil, 63, 79; output in, 110; in wartime, 108–9</td>
</tr>
<tr>
<td>Ballod, Karl</td>
<td>166, 168, 190; influence on Russians, 139</td>
</tr>
<tr>
<td>Bayernwerk transmission grid, 189</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>traction companies, 76–77; wartime diplomacy, 106</td>
</tr>
<tr>
<td>Belgium Company for Electric Lighting</td>
<td>54</td>
</tr>
<tr>
<td>Belyi ugol. See Shatunovskii, Ia. M.</td>
<td></td>
</tr>
<tr>
<td>Benkendorf Company</td>
<td>58</td>
</tr>
<tr>
<td>Bogolepov, Mikhail I.</td>
<td>115</td>
</tr>
<tr>
<td>Bogorod</td>
<td>73; district zemstvo, 81; electric stations operating board of, 145</td>
</tr>
<tr>
<td>Boilers</td>
<td>134–35, 149, 209, 213</td>
</tr>
<tr>
<td>Bolshoi Theater</td>
<td>1, 174</td>
</tr>
<tr>
<td>Borovev, B. E.</td>
<td>183</td>
</tr>
<tr>
<td>Brown-Boveri</td>
<td>38, 216</td>
</tr>
<tr>
<td>Bukhgeim, E. O.</td>
<td>1914 proposal, 93–94; 1915 proposal, 116</td>
</tr>
<tr>
<td>Bureau of the Unified Technical Organizations</td>
<td>109</td>
</tr>
<tr>
<td>Bush, Vannevar</td>
<td>264</td>
</tr>
<tr>
<td>Cadet party</td>
<td>143, 166</td>
</tr>
<tr>
<td>Callon, Michel</td>
<td>2</td>
</tr>
<tr>
<td>Carlson, W. Bernard</td>
<td>34</td>
</tr>
<tr>
<td>Carr, E. H.</td>
<td>253</td>
</tr>
<tr>
<td>Cement</td>
<td>170</td>
</tr>
<tr>
<td>Central Bank for Agricultural Credit</td>
<td>237</td>
</tr>
<tr>
<td>Central Communal Bank</td>
<td>227, 229–31, 233, 249–50</td>
</tr>
<tr>
<td>Central Industrial Region</td>
<td>78, 122, 241; electrification proposals, 116–17, 141–42; GOELRO analysis and plans, 160, 171–73; industrial use in, 70; local fuels, 109, 134;</td>
</tr>
</tbody>
</table>
Central Industrial Region (continued)
output, 110; peat resources, 80; planning, 129
Centralized-decentralized electrification debate: GOELRO, 178–85, 191; NEP, 192–93, 229–32, 247–56. See also Utilities
Central War Industries Committee, 27, 100, 102–3, 105; electrotechnical section, 102–4, 108, 116, 122
Cheiliabinsk regional station, 232
Chikolev, Vladimir N., 19–20, 25, 34, 83, 96; arc lights, 50; company Elektrotekhnik, 20, 48, 50
Church of Christ the Saviour, 50
Coal, 63–64, 78–79, 90, 117, 163; British, 63–64, 83, 107, 134, 207, 210; Donets, 63, 79–80, 107, 109, 113, 130, 134, 149, 207, 210, 214, 234–35, 249; “green,” 235–36; local, 93, 116, 134, 141, 149, 234–36; railroad freight, 79; Silesian, 63; wastes, 109, 113
Commissariats: of Agriculture, 157, 164–65, 237, 241–42; of Communication, 130; of Electrotechnology, proposed, 195; of Energy, proposed, 195; of Finance, 229–32; of Foreign Trade, 228, 244; of Health, 221; of Heavy Industry, 259; of Labor, 201; of Land, 130, 221; of Transportation, 195
Committee for Military Technical Assistance, 101
Communist party, 143, 151, 174–78, 261–62; and democratic centralism, 143; industrialization debate, 247, 252–54, 256; 9th party congress, 158; 14th party congress, 253
Companies, joint stock, 227, 229, 232, 237–41
Company for Electrical Regional Stations, 86; Red October, 110; wartime nationalization, 105. See also 1886 Company
Company for Electric Central Stations, 57, 79, 93
Compound engines, 46, 57
Concessions, 113, 238; Bukhgeim, 93; first tier, 46, 48–51, 53–57; hydropower, 83; opposition to, 91–94; second and third tiers, 45–46, 65–74, 91–92; traction, 76–77
Consumption: industrial, 68; per capita, 67, 73–74; traction, 68, 76
Cooke, Morris, 190
Cooperatives: NEP, 228, 232, 237, 240–41; utilities, proposed, 93–94
Council for Labor and Defense, 222
Cutter, George, 49
Dan, Fedor I., 177, 180
De Khotinsky, Achilles, 28n, 38
Demkin, D. I., 107
Diakin, Valentin A., 38
Didrikhson, Vasili F., 29
Diesel, Rudolph, 90; engines of, 224, 235
Direct current (DC): 70; preference for, 61–62, 67, 97, 219, 239; Siemens system, 49.
See also Alternating current
Dividends. See Profits
Dmitriev, V. V., 92–93
Dniepr hydrostation; GOELRO plans for, 171, 173, 186; Ministry of Transportation proposal, 86; 1900 proposal, 83; and Trotsky, 196, 254
Dobrotvorskii, V. F., 84–85
Dolivo-Dobrovolsky, Mikhail O., 26, 28, 34, 38, 51, 56
Donets Basin, 130, 171; electrification of, 113, 120. See also coal
Dreier, Lev V., 142
Drummond lamps, 18
Dzerzhinskii, Felix, 196
Edison, Thomas A., 28
Egiazorov, Ivan V., 147n
1886 Company: Company for Electrical Regional Stations, 86
and Elektroperedacha, 81–82, 216
formation of, 48
fuel choice, 63–64
growth, 95;
and Imatra, 85–86
industrial load of, 70, 226
interest in regional stations, 78–82, 97
and Lodz concession, 56
Moscow, 25–26, 50–53, 56–58, 108, 129, 132; Georgievsk station, 57, 64, 1912
interim restoration of, 70, 79
nationalization of, 104–6, 127
profits, 52–53, 56, 72, 94
Utkina Zavod station, 86
Ekaterinoslav, 113
Ekonomicheskii Zhizn, 138
Ekonomika, Trud, i Tekhnika, 139
Electric Company for the Donets Basin, 113, 128
Electrical engineers, 151, 175, 181, 261–64; development of, 25–27, 57; dominance of Moscow, 157; efforts to create a main electrotechnical committee, 157–58, 181, 221; and international community, 38–39, 185–86; “Moscow mafia,” 26–27, 142–45; politics of expertise, 116–19, 140–41; wartime tasks, 100–101
Electric energy: cost, 72–73; “democratic application” of, 90–91, 95; most rational form of energy, 90
Index 267
268 Index

Electrotechnical organization: of provisional government, 123–25, 144; Soviet, 126–30, 194–200, 255
Electrotechnical societies, 22–24. See also VI Section
Elektricheskaia Sila, 58–59
Elektricheskoe Delo, 23
Elektrichество, 20, 23, 39, 129, 245; founding, 22; revival, 200
Elektrifikatsiia, 200, 238, 240, 243
Elektrika, 232, 240
Elektrobank, 193, 195, 200, 227–34, 247, 250, 253, 256, 259
Elektroekspluatatsiia, 240–43
Elektrokrai, 240
Elektrokredit, 227–29, 232, 237, 240–42
Elektroperedacha, 25, 79, 95, 116, 145, 212–13, 215; creation of and delays in operating, 81–82, 108; during civil war, 132, 135–37; nationalization of, 104–6, 127; Pavlov, Glukhov, and Orekhov stations, 212
Elektroplan, 198–99, 213, 227, 250
Elektropomoshch, 232, 240
Elektroselstroi, 237, 240–45
Elektrostroi, 126, 128–29, 146–49, 194–95, 197–98, 201, 203; authority to construct powerplants, 129; Petrograd cuts, 134
Elektrotekhnicheskii vestnik, 22
Elektrotechnische Zeitschrift, 39
Elektroteknik, 22
Elektrotekhnik (Company). See Chikolev, Vladimir N.
Elektrotok, 127; founding, 243
Elektrozem, 241
ETO, 145, 147, 157, 159, 184, 193–95, 205, 209–10, 221; and Elektrotok, 127; formation of, 126–29; technical assistance of, 137; See also Glavelektro
Evens, William M., 140
Extraordinary Commission for Electricity Supply for Moscow, 132, 135, 145
Extraordinary Commission for Managing the Unified Electrotechnical Industry, 145
Fain, I., 57
Feldman, G. A., 228n
Financing: differences between 1914 and 1924, 227; and GOELRO, 173, 182; Griendevskii’s proposals, 141; of Leningrad stations, 211–12; municipal concerns, 65–67; NEP, 193, 200, 219, 224–34, 248–49, 254; regional transmission network estimate, 95; of rural electrification, 239, 242–43; state funding, 204–5, 232–34, 252, 258
Finland, hydropower in 82, 84, 86
Ford, Henry, 162, 250; Fordism, 247
Foreign involvement in Russian electrification, 5, 66; Belgium traction concessions, 76–77; GOELRO reliance on, 161, 168, 185–87, 190–91; investment, 37–40; and NEP, 244–47; profits, 72; technology transfer, 38. See also individual companies and countries
Fors company, 86, 112
France: traction in, 75; wartime diplomacy, 106
Fuel: “fuel hunger,” 130–37, 169, 237, 249–50; local, 78, 93, 109, 116, 134, 141, 161, 163, 215, 234–36; 1910–13 crisis, 79; patterns, 62–64; perception of, 213–14; shortages, 107–10, 122, 141; vegetable, 162–63. See also Coal; Hydroelectric power; Oil; Peat; Ramzin; Wood
Fuller, William C., Jr., 11
Ganz company, 50–51
Gas: companies, 49, 54; lighting, 33, 44–45, 117
GAU, 17–20; Artkom, 17–18; Okhtensk gunpowder factory, 26, 83; support of Pirotskii, 35–36; Volkovo field test facility, 29
Geertz, Clifford, 2
Gefter, Semen D., 113
Generators, Alliance and Gramme, 19, 29, 32
Georgia, prewar hydropower in, 83
Germany: and Elektroselstroi, 242; experience and theory in, 139–40; peat, 81; plow, electric, 165–66; power stations in, 46–47; Russian dependence on, 101, 114; technological visions, 88; traction in, 75; in wartime, 111. See also Nationalization
General Electric, 245
“Giant Power,” 188
Glavenergo, 259
GOELRO, 6, 141, 145, 194, 215, 231, 233, 254, 259, 264; assumption of normal international relations, 186; creation of, 157–58; dissolution into Gosplan, 197–98; financing, 227; minimum and maximum programs, 160, 187; non-Communist staff, 142–43, 190; work, 158–67
duration, 167, 188, 201
economic and political foundations, 153
exports, 169, 172–73, 185–86, 235
implementation, 200–7, 246, 250–52, 258
minimum program, 203–4, 226
GOELRO plan (continued)

1926–31 plan, 253–54, 256
opposition to, 153, 178–85, 191; "electrofiction," 174, 180, 189, 191
repudiation by utilities, 193, 247–50

Goltsman, Abram Z., 195–96

Gorev, Aleksandr A., 187, 198, 207, 253

Gorodskoe de/o, 92

Gosbank, 229

Gosplan, 141, 145, 187, 193, 195, 197–99,
220, 222–24, 235, 238, 247, 250, 252–57,
259; energy section of, 198; and financing,
230–34

Gosselsindikat, 241

Graftio, Genrikh O., 87, 148, 149

Great Britain: nationalization of electric util­ities, 189; traction in, 75; utilities, 47

Grinevetskii, Vasilii 1., 100–01, 109, 142–44,
159, 163, 183, 190, 196; Poslevoennye per­spektivy russkoi promyshlennosti, 140–41

Groman, Vladimir G., 143

Grozny, 63

Gube/ektrootde/, 222

Gue and Shmattser Company, 54

GUKKh, 197–98, 220–24, 226, 228, 248

Gurevich, P., 116; postwar future, 117, 120

Hamm, Michael F., 73

Heat committee, 25, 108, 134–35, 141–42,
144–45; formation, 109; hydropower, 112;
Makarev boiler, 134–35

Helios company, 54

Hermitage Gardens, lighting of, 33

Holland, peat in, 80

Hughes, Thomas P., 2–3, 35, 47, 96, 265

Hydroelectric power, 42, 78, 80, 93; conces­sions, 83; Dobrotvorskii proposals, 84–85; Ganz proposal, 50–51; GOELRO plans,
169, 172–73, 176; inability to develop for St. Petersburg, 80, 82–87; industrial sta­tions, 83; NEP years, 204–7, 210, 212, 216, 234–36; and provisional government,
124–25; tsarist proposals, 83, 86–87; and utilities, 83; VI plans, 118; wartime at­tempts to develop, 109, 112–14. See also Finland; Ganz company

Imatra company, 85–86, 105

Imatra River, 112; 1896 hydropower pro­posal, 84

Imports, wartime, 103–4

Industrialization: and geographic location,
111–12; and metallurgy, 170, 247, 256;
priority, 149; rational siting of, 116; tsar­ist, 2–3

Industry: concentration in first tier, 70; structure of, 69–70. See also Load

Information: GOELRO methodology, 160–63; and Grinevetskii, 141; inadequacies

of, 182–83; initial attempts to collect, 39;
planning and material indices, 161–62,
186; statistics, 199; unit of analysis, 79,
115, 120, 129, 160–61

Institution of Electrical Engineers, 24

International Bank, 37

Invention, 27–36; lightbulb heaters, 135;
Makarev boiler, 134–35

Ireland, Shannon scheme, 189

IRTO (Imperial Russian Technical Society),
21–22, 114; VIII (railroad) section, 117, 119; wartime information bureau, 101. See also VI Section

Ispolkom, 220, 238, 240

Ivanovo-Voznesensk, 69

Jablochkov, Pavel N., 25, 28–35; company,
20, 22, 30, 33, 50; invention of "Jab­lochkoff candle," 30–32

Kamenov, Lev B., 177

Kamenskii, Mikhail D., 205

Karabash copper factory, 207

Kashira regional station, 147, 149, 187, 203–
4, 215–16, 236, 258

Kazan, 226

KEPS (Committee for the Study of Natural
Productive Forces of Russia), 101, 115

Kerosene: lighting with, 13, 44–45, 58, 117,
138; tax on, 14. See also Lighting: street

KGS, 145–46, 194, 197, 221; formation of,
127–29. See also Elekstrooi; TsES

Kharkov, 46, 71–72

Khozraschet, 217, 224–25

Kiev, 64, 122; nationalization in, 104–5; trac­tion in, 75

Kirsh, Karl V., 109, 144, 159, 196; firebox,
134

Kizel regional station, 201–4, 207, 246

Klasson, Robert E., 26–27, 56, 81, 83, 142–43

Kleiber, 50

Klingenberg, Georg, 89, 139

Kogan, Aleksandr G., 113, 159

Kommunalnoe de/o, 200, 221

Konn, Stanislav V., 29

Konvitz, Josef W., 4

Korostashevskii, Isaak E., 195–97

Kovalevskii, Vladimir I., 114–15

Krasin, Leonid B., 25, 27, 58, 102, 142–43,
145–46

Kronstadt, 19

Krug, Karl A., 109, 144, 162; Elektrifikatsiia
Tsentralno-promyshlenogo raiona, 141–42

Krupskaia, Nadezhda, 26, 142

Krzhizhanovskii, Gleb M., 26, 116–17, 128–
29, 142–43, 145, 147n; at 8th Party Con­gress, 174–78; GOELRO, 157–58, 186,
189–91; handling of opposition, 166, 179–
Khrzhizhanovskii (continued)
85; Lenin, 151–53, 155; material indices, 161–63; and NEP, 195–96, 198, 201, 205, 227, 250–53, 264; at 9th Congress of Soviets, 187–88
Kuibyshev, Valerian V., 195–96, 201
Kulebakin, Viktor S., 159
Kushner, Boris, 143, 145, 162, 180
kustar handicrafts, 90, 94, 170, 194, 226, 232, 241, 243; lightbulb heaters, 135, 159

Labor, 65–66, 106, 124n, 168–69
Lagovskii, 182
Larin, lu., 143
Legal framework. See Provisional government; Soviet government; Tsarist government
Lena gold mines hydrostation, 83
Lenin, 139, 142–43, 147–48, 151–58, 167–68, 181, 190, 220, 256, 261; attacking Shatunovskii, 180; at 8th Party Congress, 174–78; and electric plow, 166; as propagandist, 3, 155; Razvitie kapitalisma v Rossii, 153
Lenningrad. See St. Petersburg
Levitskii, A. F., 182
Lighting:
arc, 43, 50, 106–7; Dobrokhotov, 32
arguments for, 44–45, 138
incandescent Edison, 19, 30
lamps, 43, 51; carbon filaments, 91; democratization of, 90–91; tungsten filaments, 90, 122
street, 33, 44–45, 65
wartime restrictions, 107–8, 122
See also Gas; Jablochkov, Pavel N.; Kerovsene; Lodygin, Aleksandr N.
Litoshenko, L. N., 166
Load: factor, 70; increasing, 226; industrial, 46, 56, 58, 67–70, 219–20, 244
Lodygin, Aleksandr N., 28–30, 34–35, 48; light bulb, 29, 135
Lodz, 46, 56, 63, 73, 82
Lomonosov Prize, 29

Main Administration for Municipal Affairs, 13–14
Main Administration for State Construction. See KGS
Main Administration for Zemstvos, 82
Main Fuel Administration, 195
Main Peat Committee, 132
Maizel, D. M., 91
Makarev, Tikhon F., 134; wood-burning boiler, 134–35
Marx, Karl, 190
Mazut, 64
Meingardt, 51

Mensheviks, 143–44, 177; “technocratic soul of,” 143. See also Dan, Fedor I.
Metall factory, 211
Meters, 211
Metropolitan Vickers, 38, 245
Miliutin, Vladimir P., 178
Millard, A. J., 34
Mine Officer Class, 19, 50
Ministry: of Communications, 107; of Finance, 11–13, 15, 48, 66, 85; of Transportation, 86–87
Misa, Thomas J., 20–21
Mitkevich, Vladimir F., 102n
Model agreement of 1897, 43, 54, 60, 64, 96
MOGES, 132, 135–37, 212–13, 216
Monopolies: natural, 4. See also Concessions
Moscow, 46, 60, 122, 171, 175; and civil war, 132, 134–37; consumption of electricity, 73, 91, 110; early attempts to illuminate, 49–50; 1895 contract with 1886 Company, 53; fuel, 63–64; generating capacity, 51–52; and nationalization, 104–6, 127; and NEP, 195, 207–8, 212–16, 218, 223, 235, 250; 1908–11 renegotiations, 57; and planning, 199, 213–14; regional stations, 81–82; Soviet of Workers and Peasants Deputies, 129, 139, 145, 242; suburban traction concession 79, 93; traction in, 76–77; in wartime, 108. See also 1886 Company; Elektroperedacha
Moscow Company for Electric Lighting, 50
Moscow Higher Technical School, 100, 109, 142, 162
Moscow River, 50
Moscow Thermo-Technical Institute, 196
MTP (Ministry of Trade and Industry), 11–12, 23, 82, 87, 103, 107–8, 113–14, 119, 122–23, 125; Section for Electricity, 123; SED, 123–25, 128, 145
Municipalization, 89; of gas companies, 49; possibility of takeovers, 79–80; and progressive politics, 88–93; of utilities, 91–92. See also Concessions
Murman, 186
Murray, William S., 190
MVD (Ministry of Internal Affairs), 12–14, 23, 66, 84–85, 87, 107, 109, 113–14, 123, 125, 197
Narodnoe Khoziaistvo, 147, 149
Narva river, 1894 hydropower proposal, 84
Nationalization: Soviet, 127; wartime, 104–6
National style, 42, 68, 97, 191
Navy, 16, 19–22, 107; work with Jablochkov, 32–33
NEP, 184, 191, 192–94, 212, 222, 255; smychka, 192
Network technologies, 3–4, 15
Nevskii Prospekt, lighting of, 48–49
Index

Niagara Falls, 82, 84
1905 revolution, 64
Nizhegorod regional station, 203
Nizhni-Novgorod, 14, 204, 221
NKVD, 127, 193, 222–23. See also GUKKh
Nobel firm, 58, 64
Northern region, 204; GOELRO plans for, 171–73, 180; Gorev-Shvarz plan, 186; planning bureau, 130, 147
Novorossiisk oil terminal, lighting of, 44
Obukhov factory, 211
Odessa, 46, 50, 171, 186
Oil, 63–64, 107, 109, 134, 136, 149, 163, 207, 210, 213–14, 234–36. See also Kerosene
Oranienbaum station, 203, 246
Palchinskii, P. I., 143
Peat, 109, 116, 118, 134, 141, 172; institutional support of, 132; and NEP, 207, 210, 212–16, 234–36; prewar development of, 80–82; regional plans for, 93; substitution of, 132. See also Elektroperedacha; Fuel
Perelman, I. Ia., 78, 89–90, 92–93
Petersburg district zemstvo, 86
Petrograd. See St. Petersburg
Petrotok. See Elektrotok
Petrovsk theater, lighting of, 44
Petrushesvskii, Vasili F., 17–18, 20
Piatigorsk hydrostation, 83
Pirotskii, Fedor A., 35–36, 48
Planning, 169, 178, 201; and civil war, 126–27, 145–47; early, 198–99; and financing, 230–31; GOELRO, 159–63; KGS, 129; in Leningrad, 210–12; methodology, 140–41, 161–63; in Moscow, 213–14; organizations, 129–30, 146–47; rural, 147; wartime, 114–20. See also Information
Plov, electric, 165–66, 241
Polish war, 158
Politics for electric power. See visions of technological development
Polivanov, Mikhail K., 113
Private Bank, 38
Private stations, 43, 51. See also Factory stations
Profits, from traction, 77. See also 1886 Company; Utilities
Prombank, 229–30, 259
Provisional government, 122–25; Central Economic Committee, 122
Provdnik factory, 149
Pultov factory, 211
Radchenko, Ivan I., 26, 142, 147n
Radchenko, Stephan I., 26
Railroads, 9–10, 12, 78–79, 105, 146;
GOELRO analysis of, 161; GOELRO plans for, 169, 188; and NEP, 200, 234, 243, 252, 255–56; 1917–22 railroad plan, 116–19; Poltava railroad workshop, 33; shortages, 135
Ramzin, Leonid K., 144, 196, 214, 259; fuel balance, 162–63; “Ramzinists,” 196
Rational movement, 115–16, 139–47, 195; to industry, 169–70; municipal skepticism, 223–24
Rattrn, Pavel N., 57, 86
Reagan, Ronald, 151–52
Recession, 1899–1902, 54, 56, 72
Red October regional station, 86, 110, 203, 210–12, 258
Regional stations, 5, 109
Bukhgeim proposals for, 93–94, 116 and civil war, 127, 141, 146–50 enabling technologies, 78, 81–82, 90 funding, 204–5
GOELRO plans: and foreign equipment, 154; numbers, 171, 176, 187 and NEP, 200–207, 232, 236, 239, 243, 246–51, 254–59, 262 and provisional government, 123 utility interest, 43, 78–87 visions and proposals, 43, 78, 87–95 in wartime, 111–14, 116–20. See also Centralized-decentralized electrification debate; Elektroperedacha; Kashiira regional station; Red October regional station; Rostov-on-Don; Shturvar regional station; Shterev regional station; Svir hydrostation; Volkhov hydrostation
Remeslo industry, 90, 94
Remington, Thomas F., 143
Revoluiutsiia i elektrifikatsiia. See Kushner, Boris
Riga, 46, 63
Riga Polytechnic Institute, 34
Romanov, Konstanin N., Gen.-Adm., 32
Rostov-on-Don, 54, 80; and civil war, 142, 144
Ruhr, unification of, 188
Russian Company for Electric Energy, 54
Russo-Baltic factory, 149
Rykov, Aleksei L., 143, 177
St. Isaac’s Cathedral, lighting of, 44
St. Petersburg, 46, 53–56, 60, 171–72, 180, 195; city Soviet, 122; consumption in, 56, 73, 110; early attempts to illuminate, 48–
St. Petersburg (continued)
49; 1897 model agreement, 54, 79–80, 104; energy alternatives, 207; fuel, 63–64; hydro-power proposals, 84–87; incompatible standards in, 55; and nationalization, 104–6, 127; and NEP, 207–12, 216, 218, 223, 258; plans for, 199, 210–11; Section for the Communal Economy, 210; technical unification, 132, 209; traction in, 76–77, 85; in wartime, 107–9, 112. See also
1886 Company
St. Petersburg Company for Electric Construction, 57. See also Rattner, Pavel N.
St. Petersburg Company for Electric Transmission, 112
St. Petersburg Company for the Transmis­sion of Power from Waterfalls, 86. See also Rattner, Pavel N.
St. Petersburg Electrotechnical Institute, 101
St. Petersburg Naval Museum, 22
St. Petersburg Polytechnic Institute, 34, 118; graduates, 39
St. Petersburg Technological Institute, 26
Samara, 221–22
Sapolsky, Harvey, 264
Schumacher, E. F., 90
Scientific management, 170, 247
SED. See MTP
Segal, Howard P., 152
Shatelen, Mikhail A., 167, 183–84
Shatunovskii, la. M., 179–80, 197
Shatura regional station, 113, 147, 149, 200–201, 203, 215, 232, 258
Shmidt, K. K., estimate of regional trans­mission network, 94
Shortages:
of carbon rods, 106–7
in civil war, 129–37; equipment, 131;
food, 131–32, 159
and NEP, 200, 203, 210–11, 247–48
warranty, 106–10
See also Fuel
Shterev regional station, 173, 203, 232, 258
Shulgin, Evgenii la., 102
Siberia, 171, 186, 204
Siegelbaum, Lewis, 102
Siemens, Karl, 48
Siemens and Halske, 20, 27, 38, 48, 56, 86, 245; interest in Pirot­skii’s electric tram, 35–36
Sotola company, 85
VI Section, 14, 25, 39–41, 128, 137, 141, 145; activities, 22–24; creation of, 22; disappearance of, 128–29; 1886 Company, 51; membership, 23; 1916 electrification propos­al, 117–20, 137; post-civil war resump­tion, 190; wartime activities, 102, 123, 125
Smidovich, Piotr G., 26–27, 129, 147n
Smirnov, Nikolai V., 54, 64
Smolensk, 70, 221–22
Society for the Study of the City Economy, 125
Society of Electrical Engineers, 101
Society of Electrotechnicians, 24, 199
Society of Factory and Workshop Owners of the Moscow Region, 82, 105–6, 113
Society of Factory Owners, 69
Society to Assist Electrification, 240
Southern region, 171, 173
Soviet government, 126–30; and bureau­cracy, 154–55; multiple posts in, 145
SNK, 126, 195, 220, 222–23, 238, 253
Sperry, Elmer, 28
Sperry Gyroscope Company, 30
Stalin, 155, 196, 254; superindustrialization under, 161, 179
Standardized equipment, 53, 55, 167, 183–84; as political tool, 195
Starkov, Vasilli V., 142
State technology, 1, 9–12, 143, 151–53, 155, 180, 217, 236–57, 261–63
Spearhead imports, 103; work on Kashira, 216
Switzerland: wartime imports, 103; work on Volk­hov, 205
Tariffs, 46, 72–73, 91; Baku, 59; differential, 70; Kharkov, 72; lower rates for political goals, 91; Moscow, 51, 53, 73; resumption of, 211–12, 224–25; St. Petersburg, 73; wartime increases, 110, 124
Taxes on electrical energy, 14–15, 23, 124
Technological utopia, 152, 154–55, 188, 261; fallacies of, 88. See also Visions of technolo­gical development
Teller, Edward, 152
Terek, 83
Tiers. See Utilities
Todd, Edmund N., 62
Town-country split, 151, 153–54, 167, 175, 184, 244, 252
Traction, electric, 74–77; in civil war, 136; 1902 St. Petersburg concession, 85; Sovi­et, 217, 222
Transmission technology, 49, 78; cost of prewar network, 94; 1891 Lauffen to Frankfurt demonstration, 34; enabling technology, 118, 149; GOELRO plans, 182; legal, 81-83, 87, 113-14, 124-25; long-distance, 50-51, 90; low-voltage, 204, 226; networks, 137; reliability of, 216
Trotsky, Leon, 177, 195-97; defending Shatunovskii, 180; Dniepr hydrostation, 254
Tsarist government: administrative framework, 11-16, 60-61, 64-67, 81, 83, 86-87, 105, 114, 119 regulations under, 44 World War I, 100-105; Special Committee on the Struggle with German Domination, 106; special councils, 100, 105, 109-10, 112, 116

See also Concessions; Hydroelectric power; MTP; MVD; Ministry of Finance; Model agreement of 1897

Tsentrosoiuz, 228
Tsentrosoiuzkartofel, 241
TsES, 128-29, 137, 141-42, 145-47, 159, 194-95, 198-99, 215, 240 Turbines, 57, 82, 149, 205, 208, 213, 235 Turkestan, 160
Typhus, 144, 159, 201

Ugletok, 113
Ugrimov, Aleksandr I., 139
Ugrimov, Boris I., 164-65, 185
Ukrainian government, 223, 238
Ulam, Adam, 154
Union of Electric Stations for General Use, 124
Union of Electrotechnicians, 124-25, 145, 205

See also Direct current; Financing; Fuel; Load; Regional stations

Utkina Zavod station. See Red October regional station

Valentinov-Volsky, N., 197
Vallinkosk falls, 112
Vandalism, 216
Vasilevskoe Island, 54
Velichko, F. K., Gen., 22, 25
Verband Deutscher Elektrotechniker, 24, 40, 124
Vereinigung Deutscher Elektrizitätswerke, 39, 124
Verkhovskii, Vladimir P., 32
Vickers, 86
Vinter, Aleksandr V., 26, 147
Visions of technological development, 88-95, 259; alternatives to GOELRO, 178-85, 221-23; and civil war, 140-47; of Communist party, 175-78; cooperative user-owned utilities, 93; democratization of electricity, 90-91, 138; GOELRO, 159-60, 173-74; Grinevetskii’s analysis, 140-41; of Lenin, 153-55; political support for, 149-50; rural, 137-38, 263; wartime, 114-20; Western, 188-90. See also Electric energy
Vladivostok, 104
Vodopad company, 112
Voinarovskii, P. D., 25
Volkhov hydrostation, 147-49, 172, 180; Ministry of Transportation proposals for, 86-87; and NEP, 201, 203-7, 212, 216, 226, 236, 249-50, 255, 258
Volkhov river, 84, 112
Von Miller, Oskar, 189
Voprosy elektrifikatsii, 199-200
Voronov, Aleksandr A., 102
VSNKh, 126-28, 157, 159, 162, 194-98, 220-25, 259; presidium, 145, 158, 177, 201; science and technical section, 145
Vuif, Aleksandr V., 25
Vuoks river, 84, 86

Walchenseewerk hydrostation, 189
War communism, 126-50, 192, 221; shift from, 153, 169, 179, 184-85
War industries committees, 101-3
Wells, H. G., 154
West, 168, 185-86; and AC-DC, 62; anticipated investment by, 227; comparisons with Russia, 3, 34, 37, 40, 252, 259-60, 265; concept of, 3; contribution to regional stations, 215, 246; cost of electricity in, 72-73; failure to invest, 244-45, 254; "foreign is better" bias, 36; gap with, 95-96; hydropower in, 82; industrial planning, 196; justification for GOELRO, 181; legal framework of, 15; as model, 112, 123, 228, 246-47; networks in, 137; peat in, 81; regional schemes in, 153; rural, 67; traction in, 75; urbanization of, 60; utilities, 42, 45-47, 62; visions of technological development, 88-89. See also under individual countries

West Dvina river hydrostation, Ministry of Transportation proposal for, 86
Westinghouse, 38, 76
"White coal." See Hydroelectric power
Witte, Sergei, 12, 96, 161
Wood, 80, 109, 210, 213, 235; substitution of, 131-35
World War I, 5, 188; imports and, 103-4; nationalization and, 104-6; shortages, 106-10

Yalta, 65

Zagorskii, Konstantin, la., 146-47
Zemo-Avchalsk hydrostation, 205, 232
Zinoviev, Grigorii E., 177
Der Zukunftstaat. See Ballod, Karl