

Index

- adaptation, 41
 - private, 41
 - public, 41
 - social cost-benefit analysis, 95
- air pollution
 - behavioural anomalies and willingness to pay, 47
 - clash in goals of energy and climate policy, 41
 - distributional effects, 225
 - energy tax, 177
 - environmental tax reform, 179
 - fossil fuel subsidies, 23
 - goals of energy policy, 163
 - indoor air pollution, 36, 71
 - levels of air pollution, 12
 - license plate-based driving restrictions, 220
 - marginal external benefit curve, 193
 - negative externalities, 24
 - negative externality problem in developing countries, 45
 - policy instruments, 167
 - pollution standards and monitoring in developing countries, 219
 - positive externality, 182
 - positive externality with energy standard, 212
 - regulation in India, 220
 - social cost, 95
 - taxes and unintended effects in developing countries, 202
 - willingness to pay for air quality improvements, 96
 - willingness to pay for improvements in air quality, 220
- allocative efficiency, 222
- behavioural anomalies, 167–169
 - bounded rationality, 34–37
 - cognitive limitations, 34–36
 - endowment effect, 34–36
 - framing effects, 36
 - limited use of information, 36
 - loss aversion, 34–36
 - status quo bias, 34–37
 - bounded selfishness, 34
 - altruism, 36
 - fairness, 36
 - social norms, 36–37
 - bounded willpower, 34–37
 - attitude-behaviour gap, 36
 - myopia, 36
 - meaning, 3
 - monetary market-based instruments, 191–194
 - non-market-based instruments, 216–217
 - productive Inefficiency, *see* Xinefficiency
- biomass, 19
 - fuel-stacking behaviour, 71
 - progressivity of carbon pricing, 227
 - social spillovers, 37
- Cap-and-trade system. *See also* pollution permit trading system 187
- cash flows
 - coefficient of variation, 83
 - discounting, 76
 - expected value, 82–85
 - standard deviation, 82
- causality, 233
- climate policy
 - distributional effects, 225–227
 - goals, 39–41, 163–164
 - modelling effects, 228
 - types, 165
 - private, 167
 - public, 165–167
- coal
 - allocative efficiency, 223
 - clash in objectives of energy and climate policy, 41
 - clean development mechanism, 200
 - energy tax, 177
 - energy transition, 14, 15
 - environmental tax reform, 180
 - external costs, 87
 - fossil-fuel subsidies, 200
 - intangible costs, 95
 - LCoE in comparison to other technologies, 89
 - LCoE values, 89
 - market forms, 32
 - negative externalities in developing countries, 46

- non-renewable energy source, 12, 18
 - pollution standard, 206–210
 - pollution tax, 25, 173–176
- continuous emissions monitoring systems, 219
- decentralised energy systems, 99–100
- direct control measures, 214
 - curtailment of appliance use, 214
 - license plate-based driving restrictions, 220–221
- discount factor, 76
- discount rate, 76
- discounting
 - capital productivity, 76
 - decreasing marginal utility of income, 98
 - time preference, 76
- Diseconomies of scale. *See also* economies of scale 129
- dynamic efficiency, 223
- economic models, 228
 - agent-based models, 232
 - applied general equilibrium models, 229
 - DICE model, 232
 - economic growth models, 231
 - EMEC, 229
 - energy system models, 230
 - GEM-E3, 229
 - integrated assessment models, 231
 - MERGE model, 232
 - microeconomic structural models, 230
 - partial equilibrium models, 229
 - RICE model, 232
 - TIMES, 229
 - top-down models, 229
- economies of density, 130–131
- economies of scale, 129
 - centralised production structures, 130
 - computation, 129
 - network-based production structures, 130–131
- economies of scope, 133
- economies of vertical integration, 134
- elasticity of demand
 - cross-price, 60
 - income, 61
 - own-price, 60–61
- elasticity of substitution, 67
- electric cars
 - asymmetric information, 30
 - experimental evaluation of a subsidy, 235
- electricity theft, 125
- energy conservation building code, 219
- energy economics, 1–2
- energy efficiency
 - definition, 102
 - energy intensity, 106
 - energy productivity, 106
- investment decisions, 111
- measurement, 105
 - econometric approaches, 108
 - partial Indicators, 105
 - reasons for inefficiency, 103
 - stochastic frontier model, 108
- energy efficiency gap, 114
 - bounded rationality
 - cognitive limitations, 116–117
 - limited attention, 116–117
 - loss aversion, 116–117
 - present bias, 116–117
 - bounded willpower
 - cognitive dissonance, 116–117
- energy-related financial literacy, 119–120
- non-market failures
 - hidden costs, 116–117
 - uncertainty, 116–117
- private, 114
- social, 115
- traditional market failures
 - asymmetric and imperfect information, 116
 - capital market imperfections, 116
 - negative externalities, 116
 - positive externalities, 116
 - split incentives, 116
- energy policy
 - difference with climate policy, 163
 - distributional effects, 225–227
 - goals, 39–41, 163–164
 - modelling effects, 228
 - types, 165
 - private, 167
 - public, 165–167
- energy transition, 14–20
- energy-ladder hypothesis, 70
- energy-stacking behaviour, 70
- enforceability and administrative practicality of policies, 225
- equi-marginal principle, 176
- external pressures (firms), 38
- fairness, 224
- fuel-stacking behaviour. *See* energy-stacking behaviour
- geothermal energy, 19
 - LCoE in comparison to other technologies, 89
- greenhouse gas emissions, 8, 10, 11
 - atmosphere as a common resource, 28
 - clean development mechanism, 200
 - distributional effects, 225
 - goal of climate policy, 40, 163
 - impact of energy policy, 164
 - permit trading systems, 187
 - role of industrialised countries, 165

- homo economicus, 38
- hydrogen, 19
 - energy transition, 14
 - storage, 147
- hydropower, 19
 - application of IRR, 78
 - energy transition, 14, 15
 - intangible costs, 95
 - nature of costs, 128
 - persistent and transient cost efficiency, 39
 - resource rents, 136–137
 - social cost-benefit analysis, 93
 - socioeconomic impacts in developing countries, 97
 - solutions for intermittance, 16
 - use of natural resource, 136
 - water fee, 136
- information and educational programmes, 194–195
- internal pressures (firms), 38
- internal rate of return, 77–78
- isocost
 - energy efficiency, 103–105
- isocost line, 53
- isoquant, 53
 - energy efficiency, 103, 105
- learning curve, 89
 - elasticity of learning, 91
 - elasticity of learning-by-researching, 92
 - learning-by-doing rate, 92
 - learning-by-researching rate, 92
 - one-factor, 91–92
 - two-factor, 92
 - types of learning, 90
- levelised cost of energy, 85
 - definition, 85
 - limitations, 86
 - values at the global level, 87
- linear probability model (estimation of demand), 63
- long-term Agreement on Energy Efficiency for non-ETS sectors, 218
- LPG, 36, 157, 200
- management practices, 69
- marginal abatement cost, 173
- marginal rate of technical substitution, 53
- market failures, 2, 167–169
 - behavioural
 - anomalies. *See* behavioural, anomalies
 - common resources, 27–29
 - credit/liquidity constraints, 46, 123
 - externalities, 23–26
 - negative externalities, 24–25
 - positive externalities, 25–26
 - information problems, 29–30
 - asymmetric information, 30
 - imperfect information, 29
 - lack of competition, 31–34
 - monopolistic competition, 33–34
 - natural monopoly, 32
 - oligopoly, 32
 - principal-agent problems, 30–31
 - public goods, 26–27
- market forms
 - electricity markets
 - activities, 144
 - day-ahead power market, 146–149
 - merit-order principle, 147
 - modern approach, 144–149
 - reforms, 149
 - retail electricity market, 146
 - system-marginal price, 147
 - traditional approach, 144
 - wholesale electricity market, 146
 - gas markets, 157
 - monopolistic competition, 127–128, 150–151
 - characteristics, 150
 - monopoly, 127–128, 135
 - causes, 135
 - characteristics, 135
 - natural monopoly, 135, 137
 - price-cap regulation, 141
 - rate of return regulation, 138–140
 - regulation, 138
 - resource rents, 136
 - yardstick regulation, 141
 - oil markets, 157
 - oligopoly, 127–128
 - cartel model, 152–154
 - characteristics, 152
 - dominant firm model, 155–156
 - perfect competition, 127–128, 142
 - characteristics, 142
- net present value, 77–78
- net zero, 16, 17
- non-excludability, 27
- non-rivalry, 27
- nuclear energy
 - assumptions for calculating the LCoE, 89
 - effect of high social discount rates, 98
 - nature of costs, 128, 136
 - non-renewable energy source, 18
 - uncertainty in costs, 81
- nudges, 195
 - eco-labels and energy labels, 196
 - examples in the energy sector, 196
 - limitations, 198
 - types, 195
- OECD, 13, 14
- OPEC, 32, 152, 154
- parallel trends assumption, 238

- particulate matter, 12, 13
- policy acceptance, 225
- policy effectiveness, 224
- policy evaluation, 228
 - methods, 232
 - difference-in-Difference, 236–240
 - experimental, 233
 - quasi-experimental, 233
 - RCT, 233–236
 - regression discontinuity design, 240–242
- pollution permit trading system, 187
 - comparison to pollution tax, 190–191
 - functioning, 187–190
- pollution tax
 - negative externalities, 25
- poor quality of power, 124–125
- price versus quantity-based instruments, 191
- productive efficiency, 222

- rebound effect, 120–123
 - direct, 121
 - indirect, 121
- renewable energy
 - types of, 18–20
- resource curse, 160
- revealed preference methods
 - hedonic pricing, 95
 - travel cost method, 95
- revenue losses for utilities, 125
- risk, 81
 - measures of, 82
 - risk-adjusted discount rate, 82
 - types of, 81
- rivalry, 27

- salience, 190
- social cost-benefit analysis
 - indirect/secondary benefits and costs, 94
 - intangible benefits and costs, 94–96
 - kaldor-Hicks Criterion, 97
 - net present value criterion, 97
 - primary benefits and costs, 93–94
 - social discount rate, 98
 - steps, 93
- solar energy
 - levelized Cost of Energy (LCoE) calculation, 87
 - adoption in rural India, 71
 - altruism, 36
 - clash between energy and climate policy, 40
 - decentralised systems, 99, 100
 - distributional effects of subsidies, 226
 - energy transition, 14, 15
 - financing in developing countries, 101
 - high prices and energy poverty, 23
 - imperfect information, 29
 - intermittance, 100
 - land as a common resource, 29
 - LCoE in comparison to other technologies, 89
 - LCoE values, 89
 - learning curve, 90
 - learning-by-doing rate, 92
 - main uses, 19
 - monopolistic competition, 150
 - nature of costs, 128
 - positive externalities, 25
 - knowledge sharing, 25
 - security of supply, 25
 - solutions for intermittance, 16
 - subsidies, 23, 184
 - subsidy on investments costs in Switzerland, 78
- standards
 - comparison to taxes, 204
 - energy standards, 211
 - efficiency, 212–214
 - enforcement in developing countries, 219
 - performance-based, 204
 - pollution standards, 206
 - a single polluter, 206–207
 - enforcement, 210–211
 - two polluters, heterogeneous abatement
 - benefits, 208–210
 - two polluters, heterogeneous abatement costs, 207–208
 - technology-based, 203
- stated choice methods
 - choice experiment, 95
 - contingent valuation, 95
- subsidy, 181
 - challenges, 186
 - examples, 182
 - feed-in-tariff, 185–186
 - fossil-fuel subsidies, 200–201
 - initial subsidies, 184
 - justification for use, 182
 - positive externalities, 26
- sustainable development, 42–45
 - institutional definition, 42
 - strong sustainability, 44–45
 - three dimensions, 43
 - weak sustainability, 44–45
- tax, 169
 - double-dividend hypothesis, 179–181
 - energy tax, 177–178
 - environmental tax reform, 179–181
 - environmental tax. *See also* pollution tax 173
 - pollution tax, 173–177
 - benefits and challenges, 178
 - comparison with permit trading systems in developing countries, 199
 - product tax, 171–173
 - benefits and challenges, 178

- tax (cont.)
 - comparison with pollution tax in developing countries, 199
- tidal energy, 19
- time-varying pricing, 215–216

- UN, 29, 167
- unbundling, 144
- uncertainty, 81
- UNEP, 219

- voluntary agreements, 218

- weighted average cost of capital, 78–79

- Wind energy
 - LCoE calculation, 87
 - energy transition, 14, 15
 - generation, 19
 - intermittance, 100
 - land as a common resource, 29
 - LCoE in comparison to other technologies, 89
 - LCoE values, 89
 - merit-order, 148
 - nature of costs, 128
 - solutions for intermittance, 16
- X-inefficiency, 4