Index

Acquier, A. 40, 41
advertising 238
aeronautics industry 53
Aggeri, F. 40, 41
agriculture 164–79
Alcott, B. 103, 201
Andersen, M.M. 4, 45, 49
Arendt, H. 290
Arthur, W.B. 56, 83
‘artificial instruments of industry’ 146–7
artificial intelligence (AI) systems 220–22
Arundel, A. 262, 263
automated production 12, 211–12, 216, 219, 220, 243, 312
automotive industry 19, 50–51, 200
Aversi, R. 71, 72
Azomahou, T. 244, 245
banks
  bailouts 235–7, 317
  reserves 122
  see also central banks
Barreau, B. 269, 270
basic needs 12, 124, 154, 243, 312
Becker, M. 68, 71
Begun, J. 244–5
behavioural change and consumption
  evolution of habits and diffusion of eco-innovation 77–83
  questioning habits and routines of consumption 83–9
  understanding consumption 68–74
  versions of sustainable consumption 74–7
Beise, M. 261, 275
Bénabou, R. 42, 86
Bergasse, François 28–9
biofuels 26, 27, 32, 33
biotechnology 220–22
Boidin, B. 288, 298
Boulding, K.E. 178–9, 197
Bourg, D. 102, 103, 274
Boutillier, S. 139, 143, 296
Bowen, H.R. 40, 273
Brown, Jerry 23, 32
Brown, T.J. 43
Buba, J. 269, 270
Buensdorf, G. 67, 70, 81, 88
Burkett, P. 170, 172
business cycles 184–202
California
  environmental opposition 32–3
  as green state 22–3
  greening of Google and search for a green Google 26–8
  role of government 24–5
  role of universities 25–6
  role of VC industry 23–4
capital
  flexible remuneration of 125–6
  need for technological restructuring of 222–7
  optimisation of distribution 237–8
  structural crisis and shifts in technological paradigm 216–22
capital investment, green technology 262–5, 267–8
Capital (Marx) 151–3
capitalism
  environmental excesses of 296–8
  Marx on 152–3
  oppressive power of money in 122–3
  periodization and new stage of 211–13
  scientific and technological progress in context of 213–16
capitalist system, structural crisis in 216–22
carbon capture and storage (CCS) 31, 259, 264
carbon emissions tax 316, 317–18
Carrillo-Hermosilla, J. 49, 51
central banks 234, 235–6
reserve currencies 313–15
Chertow, M.R. 99, 101
China
clean technology 21–2
green growth strategy 268–71
Clark, J.M. 40, 85
classical economic theory 2, 120–22, 139–40, 144–8, 150, 163, 164–6, 169, 171, 174–6, 179–80
clean-tech
advent of 20–22
California 22–8
France 28–32
as multifaceted notion 261–2
in tough political times 32–5
Cleantech Group 20, 21, 25–6
CO₂ emissions 197, 295
events and debates relating to 254–5
CO₂, environmental Kuznets curve
discussion of results 254–6
evolution of relationship between emissions and GDP 250–54
first data analysis 246–9
Cohen, Elie 29, 34
collective perspective, corporate strategy 57–9
commodification
harmful effects of 241
of nature 171–3
common goods
financing 315–18
management of 310
communal property 150–51, 152, 154
companies
incentives for developing green-tech 39–46
investment in green technology 3, 262–5
liberation from compulsion to grow 130–31
need for political support and cooperation 54–9
promotion of new business model 46–54
see also small and medium-sized companies (SMEs);
transnational corporations
competition zones, France 30–32
competition, clean-tech sector 21–2
competitive advantage, CSR as 47–8
competitive conflict, conditions for 214–15
complex systems of technologies 55, 56, 117
conservationists, opposition to clean-tech 33
conspicuous consumption 69–70
consumerism, damaging effects of 238–9
consumers, as drivers to clean-tech revolution 22
consumption
basic assumptions relating to changes in 73–4
changes in patterns and levels of 75–7
changing unsustainable patterns of 105–7
effects of development 253–4
effects of innovation 102–4
evolution of habits and diffusion of eco-innovation 77–83
evolutionary insights and empirical evidence 68–74
freedom of choice in 240–41
and frugality 132–3
North-South divide 294–5
questioning habits and routines of 83–9
transforming behaviours 86–8
Copenhagen Accord 198, 255, 294
Cordes, C. 67, 70, 81, 88
corporate philanthropy 42
corporate social responsibility (CSR) 37–61, 265, 303
and Porterian hypothesis 42–6, 47–8
corporate strategy, collective perspective 57–9
cost structure, eco-technology 54–5
Costanza, R. 5, 139, 170, 177, 200
Cournot, Augustin 174–6
Courvisanos, J. 184, 186, 189, 190, 191, 201
Coussy, J. 289, 300
Cowan, R. 69–70
creative destruction 187, 201
credit system
  lack of prudential regulation 235–7
  social function 122
credit, firms capacity to obtain 44
crieses, frequency of 291
crowding-out effects 87–8, 89
Cultural convergence 133–4
‘cumulative causality’ 68–9
currency reserves 312, 313–15
curtailment behaviours 76–7, 85–6
Daly, H. 3, 58, 115, 121, 170, 172, 176, 181, 200
damage, needs for reducing/preventing 124
Darwin, Charles 149, 157
debt-for-nature swaps 313
decision-making process, international institutions 291–3, 302–3
del Rio, P. 49, 271, 272, 273
demand
  creation of 238, 240–41
  hierarchical theory of 82
  modification of 70, 77–8
  satisfaction of 80–81
  see also effective demand
demand economy 125–6
two track strategy for 126–8
demand-pull innovation 189–90
dematerialization and technology 101–5
democratic challenge 274
demographic growth 146, 294–5
Department of Energy (DOE), US 24
developed countries
  economic transformation 128–30
  innovation 185–202
developing countries
  adaptation of global policies 301–2
  green economy 259–77
Diemer, A. 97, 100, 107
dividend system 123
division of labour 139, 152, 289
Djeff at, A. 288, 298
Donaldson, T. 41, 57
Dopfer, K. 70, 73
Dutch Disease 274–6
East Bay Green Corridor, California 24
eco-efficiency of consumption, increase in 75–7
eco-friendly business models 225
‘eco-industrial park’ concept 101
eco-innovation, definitions/typology of 48–51
Eco-Management and Audit Scheme (EMAS) 45
eco-technology
  adoption barriers 54–5
  diffusion of 81–3
  lock-in effects 55–6
  unproved profitability 56–7
ecological convergence 133–4
ecological economists 163, 169, 171–2, 176
  background history of thought 139–59
ecological opportunity
  in a changing world 12–14
  and economic crisis 2–4
  and firm behaviour 37–61
  need for global governance 6–14
  role of innovation 4–6
  strengths of change for green economy 8–10
  theoretical origins and political aspects 10–12
ecological sciences
  birth of 148–50
  from economic sciences to 150–54
  to economic sciences 154–8
ecological unsustainability
  implications for innovation 197–201
economic activities, history of 141–4
economic control, loss of 186–7, 190–93, 194–5
economic convergence 133–4
economic crisis
  and ecological opportunity 2–4
  impact on environmental regulation 32–5
Crisis, innovation and sustainable development

economic development
historical context 134–5
and social development 288–93
relationship with pollution 243–56

economic importance, green
development 222–7

economic liberalism
and bank bailouts 236–7
and capital distribution 237–8
as discredited model 238–9
and inflation 234–5
and money printing 235–6
renouncing 241–2

economic model
building new model 239–41
failure of 238–9

economic resource, nature as 208–11
economic sciences
birth of 141–50
from ecological sciences to 154–8
to ecological sciences 150–54

economic theory as camouflage
120–22

economic transformation, rich
countries 128–30

economy of nature 116–17

effective demand 188–90, 197, 201
management of 190–93
Eicher, T.S. 244–5

electronics sector 51, 105, 220–21
Elzen, B. 273, 276

emerging economies
capital investment 237–8
green economy 259–77

employment
flexibility in 125–6
green economy 127–8, 265
see also full employment
energetician economists 177, 179
Energy and Biosciences Institute, US
26

energy consumption, effects of
innovation 102–4
energy efficiency, market growth 263–5
energy demand rebound 98, 103–4
Engels, F. 140, 141, 153–4
entrepreneurial culture
California 24–5
France 28–9

environment
disputed assessment of 293–8
innovation as means to protect
48–51
as motivation to increase added
value 47–8
perspectives on 141–50
environmental certification 44–6
environmental crisis, types of 172–3
environmental dumping 274–6
environmental education 133–4, 303
Environmental Entrepreneurs (E2) 25
environmental Kuznets curve, CO₂
emissions
discussion of results 254–6
evolution of relationship between
emissions and GDP 250–54
first data analysis 246–9
literature review 243–5
environmental movements 234, 239
convergence with social movements
240

environmental policy
and behavioural change 77
evolution of agenda 49
environmental protection
and financial stability 309–19
support for 317–18
environmental regulation
France 33–4
US 22–3, 25, 32, 34–5
epidemics 141–2, 143
Erkman, S. 97, 100, 101, 102, 103, 177, 178
essential services 126
Europe, pollution 141–4
evasive innovation 185–7, 198, 199
evolutionary theories 51–4
exchange value 73, 163, 164–6, 169,
171
‘experience goods’ problem 80–81, 83
extensive development 210–13
external incentives, firms 39–46
extrinsic motivation 77, 79, 86–9

Ferrary, M. 24, 29, 30–31
financial bubbles 19, 23, 129, 196, 201,
218–19
financial globalization 121

harmful effects of 241
Index

325

and optimal capital distribution 237–8
financial investors, green markets for 262–5
financial markets
mergers and acquisitions 265
support for stabilization of 315–17
see also banks
financial stability and environmental protection 309–19
financial transaction tax 315–17
France, clean technology
economic thinking 233
entrepreneurial culture 28–9
environmental opposition 34
inflation 234
innovation cooperation 53–4
non-technological change 51
tools 30–32
venture capital 29–30
free resources, management of 173
Freeman, C. 5, 59, 187, 189, 196
Freeman, R.E. 41, 287
Frey, B.S. 67, 77, 86, 87, 88
Frosch, R. 97, 105, 177–8
frugality 132–3
Fuchs, D.A. 75, 77, 82
full employment, political aspects of 190–97
G-20 311, 312
Gabas, J.-J. 289, 300, 301
Gabus, A. 60, 310, 315
Galbraith, J.K. 192, 292
Gallopoulos, N.E. 97, 105, 177–8
geographical economics 155–8
Georgescu-Roegen, N. 97, 108, 171
global capitalism 211–13
global change and economic opportunity 12–14
global convergence 133–4
global development, green economy 261–7
global governance
crisis in system of 287–98
and debt restructuring 312–13
and monetary system reform 313–15
need for 6–14
reform of 298–303
and Stiglitz Report 311–12
and taxation 315–18
global information networks 220–22
global public goods (GPC) 299–300, 305
global threats and responses 310–11
global warming 216, 295–6
debate on 117
differential responsibilities 255
economic consequences of 5, 222–3, 239
fight against 22–3, 25
statistics 295
Global Warming Solutions Act, California 23, 25
globalization 237–8
defence against 128–30
environment-related sectors 267–71
goods, going beyond existing perceptions of 84–6
Google, greening of 26–8
government borrowing 235–6
government support
clean-tech sector 24–5, 30–32
innovation 185–202
eco-technology 53–4, 58–9
Gowdy, J. 88, 171
Grandjean, A. 233, 241
green business innovation capabilities (GBICs) 52–3
green business markets, growth and attractiveness of 262–5
green development, need for 222–7
green economy
barriers 271–6
foundations 5–6, 261–7
opportunities 267
progressive globalization of 267–71
strengths of change for 8–10
‘green powers’, emergence of 267–71
green state, California as 22–3
greenhouse gas emissions 197, 255, 276, 294–6, 297
Greening, L.A. 75, 103
Grenelle de l’Environnement conference, France 31, 33–4
Grimes, P.E. 12, 245, 250, 256
gross domestic product (GDP)–CO₂ nexus 246–54
habits
   changing 84–6
   evolution of 68–74
   questioning 83–9
   role of knowledge 78–81
   role of market dynamics 81–3

Haeckel, Ernest 140, 149–50
Hamdouch, A. 260, 261, 262, 263, 266, 267, 270, 271–2, 273, 274, 277
Heiskanen, E. 85, 262
Hodgson, G.M. 68, 69, 85
Hugon, P. 289, 292, 300, 301
human needs/wants 96
   categories of 124–5
   transformation of 67–90
   see also basic needs
Hunt, T. 143, 153
ideological importance, green
development 222–7
imitation behaviours 69–71, 83, 88–9
import tax 317–18
income equality 315–17
income-environment nexus 243–56
incremental innovation 37, 49, 60, 88, 99, 186–7, 194–5, 199–200, 263
indirect rebound mechanisms 103, 104
industrial control, loss of 186–7, 190–93, 194–5
industrial ecology 97–108
   goals of 59
   merging with political ecology 105–7
   and renewability of resources 177–9
industrial metabolism 102, 178
industrial resources, renewability of 174
industrial symbiosis 4, 59, 99–101
inequality 288–93
inflation 191, 193, 215, 233–5
   and money printing 235–6
information and communication
technologies (ICT), age of 5–6, 60
innovation
   effects on consumption 102–4
   implications of ecological
   unsustainability 197–201
   as means to protect environment
   48–51
   political economy of 184–202
   role in ecological opportunity 4–6
Schumpeter and Kalecki on
   typology and impacts of 263
innovation clusters
   California 25–6, 28, 30
   France 30–31
   structuring role 273–4
innovation cooperation 53–4
institutional balance 274
institutional coherence 301–2
institutional context, consumption
   68–74
instrumental approach, social
   responsibility 42
intensive development 210–13, 215–16, 220
inter-generational equity 96, 214, 254, 288, 294
interest system 122–3
internal objectives, firms 42–6
International Debt Restructuring
   Court, proposal for 311, 312–13
international division of labour (IDL)
   289–90
International Energy Agency (IEA)
   97–8
International Monetary Fund (IMF)
   decision-making processes 292–3
   policies of 288, 289, 290, 291
   special drawing rights (SDR) 312, 314–15
intrinsic motivation 71, 77, 79, 86–8, 89
invention 184–5
inventory (Kitchin) cycles 188–90
investment behaviours 76–9, 85–6
investment cycles 187–90
involuntary stakeholders 41
iron and steel industry 51
ISO 14000 44–6
Jackson, T. 76, 106, 272
Joint Bio Energy Institute, US 26
Juglar investment cycles 187–90
Kaldor, N. 189–90
Kalecki, M. 184, 185, 193–4, 196, 198, 201
   on innovation 187–90
Index

on political aspects of full employment 190–93
Kalundborg industrial symbiosis initiative 59, 99–101
Katz, M.L. 56, 83
Kemp, R. 4, 38, 49, 199, 201, 261, 262, 263, 273, 274, 275, 276
Kern, F. 273, 276
Keynes/Keynesianism 123, 124, 130, 133, 191, 192, 193, 198–9, 219
knowledge and consumption 79–81
Kramer, M.R. 42, 47–8
Kregel, J. 196, 199
Kyoto Protocol 2, 255, 294, 295–6, 318
labor
and capital 121
division of 139, 152, 289
flexibility of 125–6
role in production 166–73
tensions with capital 41
upgrading social character of 227
labor theory of capital 151–3
land
and natural capital 168–73
Physiocrats and exclusive fertility of 166–8
role for precursor economists 164–6
Laperche, B. 39, 51, 53, 302, 303
Laramie, A.J. 192, 193–4
Latouche, S. 67, 136
Lazaric, N. 51, 52, 67, 68, 69, 71, 84, 87, 88, 272, 273
Le Blanc, Gilles 27–8
learning process, firms 52
legitimacy, firms 40–41
Lesser, F.-C. S. 26, 149
life cycles 43, 84, 102, 105
life process, reversing 117–19
loan guarantees 24–5
localization 128–30
lock-in effects 54–6, 69, 71, 82, 84, 259–60, 272–3
long wave (Kondratieff) cycles 187–90
Lorek, S. 75, 77, 82
Lovins, A.B. 56, 59
macro level consumption change 88–9
maintenance/management behaviours 76–7, 86
Mair, D. 192, 193–4
man and nature 165–6, 174–6
Manchester, pollution 143
Manning, P. 201
Manuscripts (Marx) 153
Maréchal, K. 67, 69, 87, 88, 272, 273
marginal innovation 198–9
marginal utility 81, 210–11
market boundaries, green technology 261–2
market dynamics, role in eco-innovation diffusion 81–3
market fanaticism 285, 291
market growth, green technology 262–5
market position, firms 45–6
markets, weak contestability of 271–2
Marouby, C. 145, 151
Martinez-Alier, J. 67, 171–2
Marx/Marxism 140, 151–3, 154, 163, 165–6, 167, 168–9, 193, 213
on renewability of resources 174–6
Massachusetts Institute of Technology (MIT) 33
Matagne, P. 149, 157
Meadows, D.H. 2, 197, 211
Menger, C. 73, 80, 82
mercantilism 120, 121, 135, 139, 140, 144, 293
mergers and acquisitions 265, 317
Mill, J.S. 115, 140, 154, 158
Mirabeau, P. 166, 168
monetary evaluation, natural capital 171–2
monetary system reform, impact of 313–15
money economy 118–23
greening 127
money printing 235–6
money system 121–3
money-must-grow system 119–20
monopolistic capital 12, 192, 196, 200, 211–14, 217, 219–22
More, Thomas 150–51
motivational disposition 71–3, 75, 77, 79–80, 83, 86–9
Mousnier, R. 141, 143
Mulder, P. 180–81
nanotechnologies 220–22
national-global policy complementarity/linkage 301–3
natural capital, critique of 168–73
‘natural instruments of industry’ 146–7
nature commodification of 171–3
as economic resource 208–11
economy of 116–17
role in production a 164–8
Nelson, R.R. 51, 52, 67, 68, 71
neo-classical economic theory 3, 120–22, 163, 169–70, 176, 179
neo-liberalism contractionary approach 199–200
failure of 288–93
networks, structuring role 273–4
new business model environment as motivation to increase added value 47–8
innovation as means to protect environment 48–51
new knowledge and new capabilities as conditions of feasibility 51–4
new economic model building 239–41
developed countries 128–30
flexibility in 125–6
two-track strategy 126–8
new knowledge/capabilities as conditions of feasibility 51–4
Nikvist, B. 273, 276
non-governmental organizations (NGOs) 297, 302–3
non-renewable resources 170, 209–11
non-technological changes 50, 51, 263
North-South divide 288–93, 294, 298
Not In My Backyard (NIMBY) 297–8
Obama, Barack 19–20, 22, 32
Olander, F. 71–2, 76, 85–6, 87
old technologies domination of 54–6
government support for 196
marginal costs 194–5
operating costs, firms 43–4
Oppenheim, J.M. 266
Organisation for Economic Co-operation and Development (OECD), definition of eco-innovation 49–50
organizational innovation 99–101
output scale effect of development 253–4
participative democracy 241–2, 288–93, 297, 301–3
past developments/losses, needs compensating for 124
patents 51, 216–17, 265
path dependency 71, 73, 82–3, 272–3
Pearce, D.W. 3, 198, 303
Pearson, P. 4, 49
Perez, C. 5, 6, 59, 60, 187, 189, 196, 218
Pernick, R. 21, 22
Physiocrats 2, 120, 144–5, 150, 163–5, 170, 177, 180
and exclusive fertility of the land 166–8
and renewability of resources 173–4
Pickett, K. 316–17
Polanyi, K. 121, 236
policy control, loss of 186–7, 190–93, 194–5
political agendas, green growth 265–7
political aspects ecological opportunity 10–12
full employment (PAFE) 190–97
political aspects of innovation (PAI) 193–7
implications 197–201
overview 185–7
political business cycles (BPC) 190–93, 195, 196
political ecology, merging with industrial ecology 105–7
political importance, green development 222–7
pollution haven hypothesis 243–4
pollution permits 2–3, 199, 297
pollution, history of 141–4
Ponzi schemes 196, 199–200, 201, 218–19, 235–7
Porter, M.E. 42–8, 99, 194
power imbalances, North-South 292–3, 298
Index

precursor economists, role of land 164–6, 170
Preston, L.E. 41, 57
primary energy consumption-CO₂
 nexus 246–54
process innovation 46, 188, 190, 195
product innovation 46–7, 188, 190
product substitution 50, 75–8, 103
production
changing unsustainable patterns of 105–7
flexibility in 125–6
freeing from modern money system 119–20
reducing 126–8, 240
as regeneration 177–9
relocation of 12, 241, 217, 297
role of nature 164–8
productive forces, transformations in
structure and dynamics 215–16
profit maximization and CSR 42–6
profitability, eco-technology 56–7
Proposition 23, California 25, 34–5
protectionism 128–9, 241, 270, 274–6, 303, 318
public investment 89, 192, 198–9, 218
public services 126, 236
purchasing power 122–3, 234–5
Quesnay, François 140, 144, 145, 163, 166–7, 168, 170, 173–4, 177, 180
radical innovation 186–7, 189, 195, 196, 271
Ray, John 148–9
Rayment, P. 290
re-greening the planet 131–2
real economy
competition for capital 237–8
effects of capitalist expansion 291
as generator of growth 119–20
rebound effect (Jevons Paradox) 75, 98, 103–4
Reclus, Elisée 155–6
recycling 87, 98, 99–101, 102, 170, 181
limitations of 118
Reinstaller, A. 67, 70
Renaissance 140, 150–51
renewable energies, market growth 263–5
Renewable Energy Law, China 275
Rennings, K. 49, 261, 262, 275
rent-seeking behaviour 192, 195, 277
rents 167–8, 169, 273
reproductive technologies 220–2
reputational advantage, firms 43, 44
research and development 53–4, 214–15, 265, 266–7, 268, 270–71
resource depletion 197, 294–5
history of 141–4
resource productivity, increasing 101–5
resource renewability
energetician economists on 177
Marx and Cournot on 174–6
modern approaches to 177–9
Physiocrats on 173–4
resource substitution 58, 102, 169, 210
responsive CSR 47–8
Ricardo, David 121, 145, 146, 163, 164, 165, 168–9, 170–71
Richta, R. 214, 219
‘Rio Principle’ 318
Roberts, J.T. 12, 245, 250, 256
Robins, N. 266, 270
Rothbarth, E. 185, 188
Sanditov, B. 67, 70
Sapir, J. 241, 242
Say, J.-B. 2, 139, 146–7
Schandl, H. 102, 103
Schmookler, J. 189–90
Schumpeter, Joseph 3, 5, 97, 106, 146, 185, 196, 200
on innovation 187–90
Schwarzenegger, Arnold 20, 23, 32, 34–5
scientific progress and capitalism 213–16
scientific revolution, periodization of 211–13
security measures, to control domestic protest 233, 239, 240
Sengès, A. 26, 27, 28–9, 30, 31, 32, 34
service economy 102, 104–5
Shapiro, C. 56, 83
Silicon Valley 23–5, 26–8, 29
Simon, H. 51–2
small and medium-sized enterprises (SMEs) 130–31, 215
Smith, A. 272, 273, 276
Smith, Adam 121, 139, 140, 145–6, 151, 154, 158, 163, 164–5, 167, 168–9, 170
social development 288–93
social learning and consumption 69–73, 86, 88–9
social movements 135, 223–4, 234, 239
convergence with environmental movements 240
spread of 241–2
social relationship, capital as 172, 213
society, interaction with nature 208–11
soil exhaustion 174–5
solar energy 24, 27, 31–2, 55, 89, 170
opposition to 33
and regeneration 177
Sorrel, S. 103–4
sovereign debt restructuring 311–13
spaceman economy 178–9
speculative (Ponzi) schemes 196, 199–200, 201, 218–19, 235–7
stakeholder interests 39–42
and CSR 42–6
stakeholder model, lack of evidence for 57
Stanford University 26
state power, dismantling of 289–91
‘stationary state’ 115, 140, 154
Steindl, J. 192, 199
Stern, N. 1, 5, 197, 222–3
strategic CSR 47–8
strong consumption
going beyond existing habits and perceptions 84–6
implications for consumer behaviour 75–7
social interactions and micro level change 88–9
transforming behaviours 86–8
strong sustainability 3, 58
structural adjustment programs (SAPs) 286, 289, 297
sub-prime crisis 235, 236–7, 241
subsistence economies 128–30
surplus value 167–8, 213–15, 224–5
sustainability
contrasting perceptions of 57–8
and dematerialization 105
sustainable consumption
and frugality 132–3
implications of 107
strong sustainable consumption 83–9
versions of 74–7
weak sustainable consumption 77–83
sustainable development
and political aspects of innovation 185–7
utopian objective of 287–98
taxation 315–18
technological breakthrough, lack of 6, 60–61
technological change 37, 49–51, 263
barriers to 271–6
effects of development 253–4
technological paradigm, shifts in 216–22
technological progress and capitalism 213–16
technological restructuring of capital, need for 222–7
technological revolution, periodization of 211–13
technology and sustainable development
changing patterns of production and consumption 105–7
dematerialisation 101–5
treatment of ‘bads’ in Kalundborg’s industrial symbiosis 99–101
technology diffusion, barriers to 271–6
technology disruption 81–3
technology improvement and consumption 75–7
technology transfer 25–6
theoretical origins, ecological opportunity 10–12
theoretical periodization of capital 211–13
Theory of Moral Sentiments (Smith) 151
Index 331

Thogersen, J. 71–2, 76, 79, 80, 85–6, 87
Tirole, J. 42, 86
toxic waste 295
trans-sectoral character, green
technology 262, 264
transformative innovation 59, 185–6, 195–6, 199–202
transnational corporations 211–13
Tukker, A. 105, 107
Turgot, A.R.J. 145, 163, 168–9
Turner, G. 102, 103
turning point income, CO₂ emissions 252–4, 256

United Nations (UN)
  Environment Programme (UNEP) 224, 254, 301
  Framework Convention on Climate Change (1992) 255, 318
  Millennium Declaration 288
universities, role in clean technology 25–6
University of California Berkeley (UC Berkeley) 26
Unruh, G. 67, 85, 271, 272, 273
US
  managerial thinking 40
  see also California
US dollar reserves 313–14
use value 73, 79, 163, 164–6, 167, 169, 171
Utopia (More) 150–51
utopian socialists 147–8
Uzunidis, D. 39, 60, 214, 289, 290, 291, 293, 294, 296, 297, 300
Valance, G. 142, 143
value added, motivation to increase 47–8
value of production, origin of 168–73
values, dissemination of 70–71, 73
van den Bergh, J.C.J.M. 67, 87, 90, 180–81, 201
van der Linde, C. 42–3
Veblen, T. 68, 69
venture capital
  clean-tech sector 21, 23–4, 27, 31
  lack of 29–30
Vivien, F.D. 96, 99
von Hippel, E. 89, 190
von Linné, Carl 148, 151, 154–5
wage indexation 234–5
Warming, Eugene 140, 149–50
waste treatment 87, 98, 99–101, 102, 170, 181
weak consumption
  evolution of habit and role of knowledge 78–81
  implications for consumer behaviour 75–7
  role of market dynamics 81–3
weak sustainability 3, 58
Wealth of Nations (Smith) 139
White, G. 188–9
Whitmarsch, L. 273, 276
Wier, M. 79, 80
Wilders, C. 21, 22
Wilkinson, R. 316–17
Winter, S. 51, 52, 68, 71
Witt, U. 72, 73
Wood, D.J. 41
working time reduction 240
World Bank 288, 289, 291
World Commission on Environment and Development (WCED) 57–8, 96, 285, 287, 293–4
World Intellectual Property Rights Organisation (WIPO) 51
World Summit on Sustainable Development 300
World Trade Organization (WTO) 292–3, 301
Yacoub, L. 289, 290, 291, 293, 302