

Index

- abandonment *see* discontinuation of
 - socio-technical systems
- Abbott, F.M. 32, 35
- acceptance *see* legitimacy
- Actor-Network Theory (ANT) 6, 8–9
- adaptive governance 32
- advocacy 133, 135–8, 139, 148, 151–2
- advocacy coalitions 117, 120–21, 137–8, 153, 193, 197, 198
- agency, role of 7–9, 27–8
- agents *see* capable agents
- agri-food systems 17, 70–71, 73, 75–6, 83
- ambiguity 28–9, 30–31
- American Society for Testing and Materials (ASTM) 60
- Anderson, J. 101, 102
- Anna Spiegel Center (ASC) 142–3
 - advocacy 152
 - description 139, 142–3
 - form and depth of socio-technical change 142
 - funding 145
 - industry collaboration 152–3
 - leadership 146
 - legitimacy 150–51
 - opportunity structures and capable agents 148–9
- anticipatory governance 32
- anticipatory markets
 - Ecoflex innovation process 54–7
 - market anticipations and market realities 60–62
 - consumer behaviour and market repositioning 62–4
 - polymers 52–4
 - study conclusions 64–5
 - technology governance and standardization 49–52
 - standards as 57–60
- appropriateness *see* fit for purpose
- arenas
 - capabilities of 192
 - concept of 159, 160–63
 - description of
 - European Code of Conduct for Responsible Nanosciences and Nanotechnologies Research 172–4
 - International Council on Nanotechnology 171–2
 - ISO nanotechnologies TC229 164–9
 - nanoREACH 174–6
 - Working Party of Manufactured Nanomaterials 169–71
 - development at international level 182
 - instruments 195
 - legitimacy 197–8
 - from multiple, to governance arrangement 180–81, 190
 - openness and transparency 178
 - organizational features 179
 - specificity of 177–8
 - success of 19, 181
 - trans-arena dynamics 176–7
- Assurance Code 17, 71–2, 77–8, 82–7
- assurance models 76–7
 - auditor competence 77–9
 - credibility 82–6
 - sampling 80–82
- auditing 77–8, 80–81, 83, 194
- auditor competence 77–9
- aviation companies 30
- Bakelite 52
- Barbier, M. 70, 71, 73

- Bartley, T. 73, 88
 BASF 51, 54–5, 56–7, 58, 59–61, 63–6
 Bauer, M.W. 112, 114–115, 116
 Becker, R.A. 57, 141
 Benz, A. 13, 113
 Bergek, A. 6, 9, 107, 111
 Berger, P.L. 112, 114, 125
 Bernstein, S. 73, 76, 88
 Biegelbauer, P. 132, 138, 140, 144–145, 146
 bioceramics 101
 biodegradable plastics 49–65, 193
 biomedical innovation systems 133–53
 Blind, K. 50, 96, 104, 107
 Bonneuil, C. 19, 160–63
 Borrás, S. 16, 32, 35, 37, 38, 39, 49, 62, 72, 88, 96, 105, 114, 124, 125, 135, 136, 138, 160, 162, 164, 169, 171, 172, 174, 177, 179
 Braun, D. 113, 133, 149
 bricolage 6, 8, 9
 Busch, L. 64, 71, 74–5
- Callon, M. 6, 27, 74, 75, 76, 160, 161, 162–3, 182
- capable agents
 as action of governance of change 24
 BASF acting as 61–2, 63–4
 certified sustainability 72–4
 lessons drawn from cases 191–3
 linkage with ‘everyday users’ 62
 and standardization 50–51, 88
 in translational research
 collaborations 147–9
 ‘who’ and ‘what’ of driving change 26–31, 124, 187–8
- Casper, S. 9, 26
 certified sustainability 72–4
 change, inherent political nature of 35
 civic activism 73–4
 cognitive dimension 19, 34, 39–40, 196–7, 198
 Colebatch, H. 113, 120, 123
 Collins, F.S. 141, 147
 COMET funding programme 145, 146–7, 148
- comparative political economy
 literature 28–9
 complexity theory 99–100
 Conroy, M.E. 50, 58
 consumer behaviour 62–4
 Crease, R.P. 50, 76
- credibility
 and governmentality of conduct 87–8
 of international organizations 197–8
 organizational and intellectual 193
 of standards 82–6, 192, 194, 196–7
 ‘tools’ 77
- Davenport, S. 33, 39
 DDT ban 115, 121, 122
 de-institutionalization 112
 decision-making 121
 Delemaire, A. 159, 163, 172, 173, 180, 182
 democratic legitimacy *see* legitimacy
 destabilization 114, 116, 123
 Deutsches Institut für Normung (DIN) 51, 58–9, 60–62
- discontinuation of socio-technical systems 111–12, 198
 discontinuation governance
 analysis of 122–6
 governance aspect of 112–15
 study of 115–16
 incandescent light bulb case 116–22
- discount flight companies 30
 distributed governance 32
 Dolata, U. 10, 114
 dominant designs 98–9, 107
 double movement 4
 Dunn, W.N. 113, 126
- eco-design framework 118–21, 125
 Eco-Design of Energy-Using Products Directive 18, 117, 121, 123–4
 Ecoflex innovation process
 adding value to 58
 beginnings 54–5
 from field to laboratory 55–6
 from laboratory to product development 56–7
 diversity of applications 63–4

- inclusion in advertising campaigns 63
- market introduction 60–62
- new molecule 60
- product differentiation 62–3
- reasons for focus on 51
- and standardization 17, 64–5
- economics/market approach 5–9, 14, 37, 137, 199
- Ecovio 63
- Edge, J. 116, 117, 123
- Edler, J. 32, 49, 62, 72, 88, 96, 105, 114, 124–5, 135, 136, 160, 162, 164, 169, 171, 172, 174, 177, 179
- Edquist, C. 6, 9, 32
- electric cars 1–2
- elite visionary agency 28, 41, 43
- Elzen, B. 70, 71, 73
- emergent governance 32
- empowerment of experts 37
- energy-efficient light bulbs *see* incandescent light bulb case
- entrepreneurship 133, 135–8, 139, 142, 147, 148–9, 151, 153
- environmental sustainability 9, 10
- European Code of Conduct (CoC) for Responsible Nanosciences and Nanotechnologies Research 172–4
- European Commission 112, 117, 118–19, 120, 125, 168, 173, 175, 177
- European Parliament 117, 118, 119, 120
- European Union 54, 60, 65, 118, 123
- 'everyday users' agency 28, 41, 43, 62, 64
- femoral heads 102–3
- fit for purpose 87, 197
- Food and Drug Administration (FDA) 101, 102, 141
- food packaging 52–4, 57, 63, 65
- Foote, S.B. 100, 101
- Fouilleux, E. 71, 75, 77, 86, 89
- Frantz, J.E. 112, 123
- Freeman, C. 5, 6, 8, 114
- Frenken, K. 98–9, 100
- Garud, R. 9, 114
- Geels, F.W. 6, 9, 10, 39, 72, 74, 114, 123, 126, 132, 136, 159
- Gesellschaft für Biotechnologische Forschung (GBF) 55–6, 57, 65
- Giddens, A. 6, 111
- governance
 - arrangement 160, 162, 163, 180–81, 190
 - defining 13–14
 - of discontinuation 112–13, 198
 - analysis of 122–6
 - of governance 114–15
 - incandescent light bulb case 116–22
 - as process and practice 113–14
 - of socio-technical aftercare 121–2
 - towards study of 115–16
 - governing 86–9
 - mechanisms for transitioning 74–6
 - and technological change 96–8
 - hip prosthesis case 100–104
 - innovation dynamics and PLT 98–100
 - study discussion 104–7
 - typology of modes 13, 189–91
 - governance dispositif 117
 - governance instrumentation *see* instrumentation
 - governance of change
 - achievements 198–9
 - concept of 12–16
 - defining 14–15
 - double movement 4
 - future research agenda 198–9
 - three pillars for framework
 - capable agents and opportunity structures 26–31, 187–8, 191–3
 - choice, reasons for 23–5
 - instruments 31–4, 188, 193–5
 - legitimacy 34–40, 188, 196–8
 - summary 40–44
 - as understudied 2–3, 12
 - governmentality of conduct 87–8
- Grin, J. 73, 74
- Guay, T. 73, 74
- 'guide the search' function 96, 104, 107

- Hall, P.A. 9, 113, 132, 133
 Hassenteufel, P. 137, 138
 Hatanaka, M. 75, 88
 Hekkert, M.P. 9–10, 96–7, 111
 hip prosthesis case
 regulation and exhaustion of
 innovation 102–4
 US medical device regulatory system
 101
 Hollingsworth, J.R. 10, 133
 Hoppe, R. 112, 113, 114, 120, 123, 126
 hybrid forums 160–63
- Iles, A. 53, 58
 incandescent light bulb case 116–22
 problems
 advocacy coalitions 120–21
 aftercare 121–2
 keeping on political agenda 120
 mobilising governance instruments
 121
 politically binding
 decision-making 121
 structured interactions 119–20
 incremental search 100, 102, 104
 initiative 133
 initiatives
 in biomedical innovation 138–53
 for nanotechnology 172–3
 for phasing out of energy-inefficient
 light bulbs 116–19
 for plastics degradation standards
 58–60
 innovation dynamics 98–100
 innovation, exhaustion of 102–4
 innovation system, notion of 1–2, 19
 input legitimacy 24, 35–40, 42, 125,
 177, 179, 181, 196–8
 Institute of Medicine 101, 102, 105
 institution centred approach 8, 9–10
 institutional coupling 8, 10
 institutional inertia 123
 institutionalism 26
 instrumentation
 ‘how’ of governance of change 24,
 31–4, 41, 124–5, 188
 lessons drawn from cases 193–5
 in medical device regulation case 96,
 105
 mobilising 121
 in translational research
 collaborations 144–7, 151–2
 intentional interaction 15, 16
 International Council on
 Nanotechnology (ICoN) 171–2,
 179, 183
 International Organization for
 Standardization (ISO) 50
 interpretative abilities 31, 188
 ISEAL (International Social and
 Environmental Accreditation and
 Labelling) 17, 71–2, 76–89, 192,
 194, 197
 ISO (International Organization for
 Standardization)
 attempted recreation 86–7
 for auditing practices 78, 83–4
 conformity standards 89
 new standards published 50
 TC229 164–70, 174, 179–80, 182
 third party assurance model 84–6
- Jacobsson, S. 6, 136, 153
 Jänchen, I. 58, 66
 Jenkins-Smith, H.C. 132, 137–8
- Karnøe, P. 9, 114
 Kemp, R. 9, 10, 13, 33, 72, 96
 Knill, C. 115, 116
 knowledge
 and ambiguity 30–31
 embedded in social organization
 26–7
 experiential 78–9, 82, 86–7, 192
 ‘socially robust’ 37
 and sustainability 70–72, 76, 86–7,
 89
 as system element 11–12
 Korthals, M. 33, 100
 Krzan, A. 59, 60
 Kuhlmann, S. 32, 113, 160, 161
 Kurtz, S.M. 101, 102
 landscape pressures 70, 71

- landscapes 72–3, 99–100, 106, 159, 193, 199
- Larédo, P. 159, 163, 172
- Lasswell, H.D. 113, 132
- Latour, B. 6, 89
- Lauber, V. 136, 153
- Law, J. 6, 74
- legitimacy
- building 132–3, 135, 153, 162–3
 - ‘legitimate order’ 125
 - lessons drawn from cases 196–8
 - and regulation 105–6
 - relationship with credibility 83, 85, 86, 191
 - in translational research
 - collaborations 149–51, 152–3
 - ‘why’ of governance of change 25, 34–40, 42, 188
- Loconto, A. 64, 71, 74, 75, 77, 86, 89
- logic of appropriateness 15, 29
- logic of consequentiality 15, 29
- Luckmann, T. 112, 114, 125
- Lyson, T.A. 71, 73
- ‘making sense together’ 117, 120
- Mallet, P. 83, 84
- March, J.G. 15, 29
- Markard, J. 10, 111, 114
- market anticipations 60–62
- market failure 32
- market realities 60–62
- market repositioning 62–4
- Martin, A.N. 53, 58
- Martin, P. 138, 141
- Mayntz, R. 13, 38, 114
- McKeen-Edwards, H. 116, 117, 123
- Medical Device Act 101, 104
- medical device regulatory system (US) 101
- Meier, B. 102, 103, 105
- Müller, R.J. 55, 65
- nanoREACH 174–6, 179, 180, 183–4
- nanotechnology study 163–84, 190, 192
- negotiations, hot and cold 77–86
- Nelson, R.R. 5, 6, 32, 107, 126
- niche emergences 71
- normative dimension 15–16, 29, 35–40, 44, 106–7, 187, 194, 196–7, 198
- OECD (Organisation for Economic Co-operation and Development) 174, 176–8, 180
- OECD-WPMN 168, 169–71, 178–9, 180
- Olsen, J.P. 15, 29
- OncoTyrol
- description 139, 143–4
 - form and depth of socio-technical change 142
 - funding 145, 146
 - industry collaboration 152–3
 - legitimacy 149–50
 - network structure 146
 - opportunity structures and capable agents 148
 - policy instruments 145
 - programmatic statements 152
- opportunity structures
- as action of governance of change 24
 - certified sustainability 72–4
 - different contexts for governance of change 30
 - and environmentalism 54
 - lessons drawn from cases 191–3
 - possible link with instrumentation 43
 - standardization as 17, 49
 - and STI policies in implementation 133
 - as theoretical step 41
 - in translational research
 - collaborations 147–9
 - ‘who’ and ‘what’ of driving change 26–7, 124, 187–8
- output legitimacy 24, 35–40, 42, 125, 176–7, 178, 179, 181, 196–8
- performance 74–6, 88
- Peters, G.B. 14, 133
- pharmaceutical industry crisis 134, 141, 147, 148
- plastics *see* biodegradable plastics
- PLT (product life-cycle theory) 97, 98–100

- policy analysis 32–3, 37, 41, 144
 policy dismantling 114–15
 policy instruments 31, 32–4, 38, 41–2, 124–5, 132–3, 135, 136–7, 144–7, 151–3
 policy termination 114–15
 polybutylene terephthalate (PBT) 57
 polymers development history 52–4
see also biodegradable plastics
 Ponte, S. 75, 88
 product life-cycle theory (PLT) 97, 98–100
 programmatic statements 133, 135, 137–8, 139, 148, 151, 152
- radical change governance 159–60
 arenas and hybrid forums 160–63
 governing nanotechnology based markets 163–76
 study conclusions 181–2, 190, 192
 study discussion 176–81
 regulations
 comparison with standards 50–51
 and exhaustion of innovation 102–4
 medical device regulatory system (US) 101
 regulatory frameworks 17–18, 96–8, 102, 104–5, 106, 174, 194–5, 198
 resources 30–31, 123, 137, 139, 147, 188, 193
 Rip, A. 9, 32, 33, 72, 74, 75, 138, 160, 161, 162–3
 robust design approach 8
 ‘rugged’ landscapes 99–100, 106
- Sabatier, P. 132, 137–8
 sampling techniques 80–82
 SCENIHR (Scientific Committee on Emerging and Newly Identified Health Risks) 118–19, 121
 Scharpf, F.W. 35, 36, 39
 Schot, J.W. 6, 9, 33, 74, 114, 126
 science and technology studies (STS)
 approach to ST&I 6–7
 literature 36–7, 138
 and standardization 50
 tradition 15, 33
 science citizens 37
 screening information data set (SIDS) 57
 search exhaustion 104
 Shahzad, A. 138, 141
 Shove, E. 10, 74
 Smith, A. 9, 28, 32, 37–8, 74, 123, 124
 Smits, R.E. 32, 111
 Social Construction of Technology (SCOT) 6, 8–9
 social institutions 17, 26, 29, 30–31
 socially shared legitimacy 35
 socio-cultural approach 7–10, 199
 socio-technical and innovation (ST&I) systems
 approaches in social science literature
 economics 5–9, 37
 national/regional 6
 role of agency 7–9
 science and technology studies (STS) 6–7
 socio-cultural 7–10
 definition 11
 discontinuation of 111–27, 198
 governance of change in 2–4, 12–16, 23–44
 governing aftercare 121–2
 nature of 11–12
 notion of 1–2, 19
 regimes in agriculture 70–71, 74–5
 social dimension of 12
 standardization 16–17
 of biodegradation 63–4
 for certified sustainability 83, 85, 89
 overview of treatments 193–4
 system liaisons 165, 176
 and TC299 167–9, 182
 and technology governance 49–52
 standards
 coordinating role 49, 61, 64–5, 193
 credibility of 82–6, 192, 194, 196–7
 as governance instruments 17, 70–89, 194, 196
 importance of 64–5
 as instrument for change 193–4
 investment requirements 64
 as means of transition 75

- multiplication of 50
 - sustainable 192, 194, 197
 - technical 16–17
 - analysis of, for biodegradation 51
 - comparison with regulations 50–51
 - as example of oligopolistic societal governance 190
 - inability to regulate consumer behaviour 62
 - as technology governance 57–60, 64
 - see also* ISO (International Organization for Standardization)
- Stegmaier, P. 104, 112, 123, 126
- stewardship programmes 33
- Stirling, A. 9, 29, 32, 37–8, 124
- sustainable agriculture 70–71
- sustainability 70–71
 - certified 72–4
 - governing governance 86–9
 - models of assurance 76–86
 - transitioning as performance 74–6
- synthetic polymers 52–4
 - see also* biodegradable plastics
- system failure, correcting 32
- technologies 27, 30–31, 33, 127, 134, 192, 195
- technology assessment 33
- technology governance
 - and standardization 49–52
 - standards as 57–60
- TRAIN (Translational Research Alliance in Lower Saxony)
 - advocacy 152
 - description 139, 144
 - form and depth of socio-technical change 142
 - funding 143
 - industry collaboration 152–3
 - legitimacy 149, 150
 - management structure 146–7
 - opportunity structures and capable agents 147
 - policy instruments 145–6
- transition approach 10, 29
 - transition management 28, 33, 37–8, 74
 - transitioning 74–6, 87, 88–9
 - translational research (TR) 132–6
 - literature review 136–8
 - results
 - of case study 142–4
 - legitimacy 149–51
 - opportunity structures and capable agents 147–9
 - policy instruments 144–7
 - scope and novelty 140–41
 - strategy 138–9
 - study discussion 151–3
 - tripartite standards regime (TSR) 75, 77, 79, 82, 86–9
 - Truffer, B. 10, 114
 - Turnheim, B. 114, 123, 126
 - uncertainty 11, 35, 41, 70, 73, 96, 98, 106–7, 181, 196
 - Utterback, J.M. 98, 123
 - van de Graaf, H. 112, 114
 - varieties of capitalism 9–10
 - Verhees, B. 39, 132, 136
 - Vignola-Gagné, E. 134, 140, 141, 144, 190, 195, 196
 - Vinck, D. 160, 162, 180
 - Visser, V.R. 117, 118, 123, 126
 - voluntary
 - arrangements 33
 - certification schemes 58, 173
 - compliance 35
 - instruments 172
 - standards 2, 64, 193
 - von Roth, P. 138, 141
 - Walker, G. 10, 74
 - wear debris 101–3, 105–6
 - Winter, S.G. 5, 107, 126
 - Working Party of Manufactured Nanomaterials (WPMN) 168, 169–71, 178, 179, 180
 - Zerhouni, E.A. 140, 141

