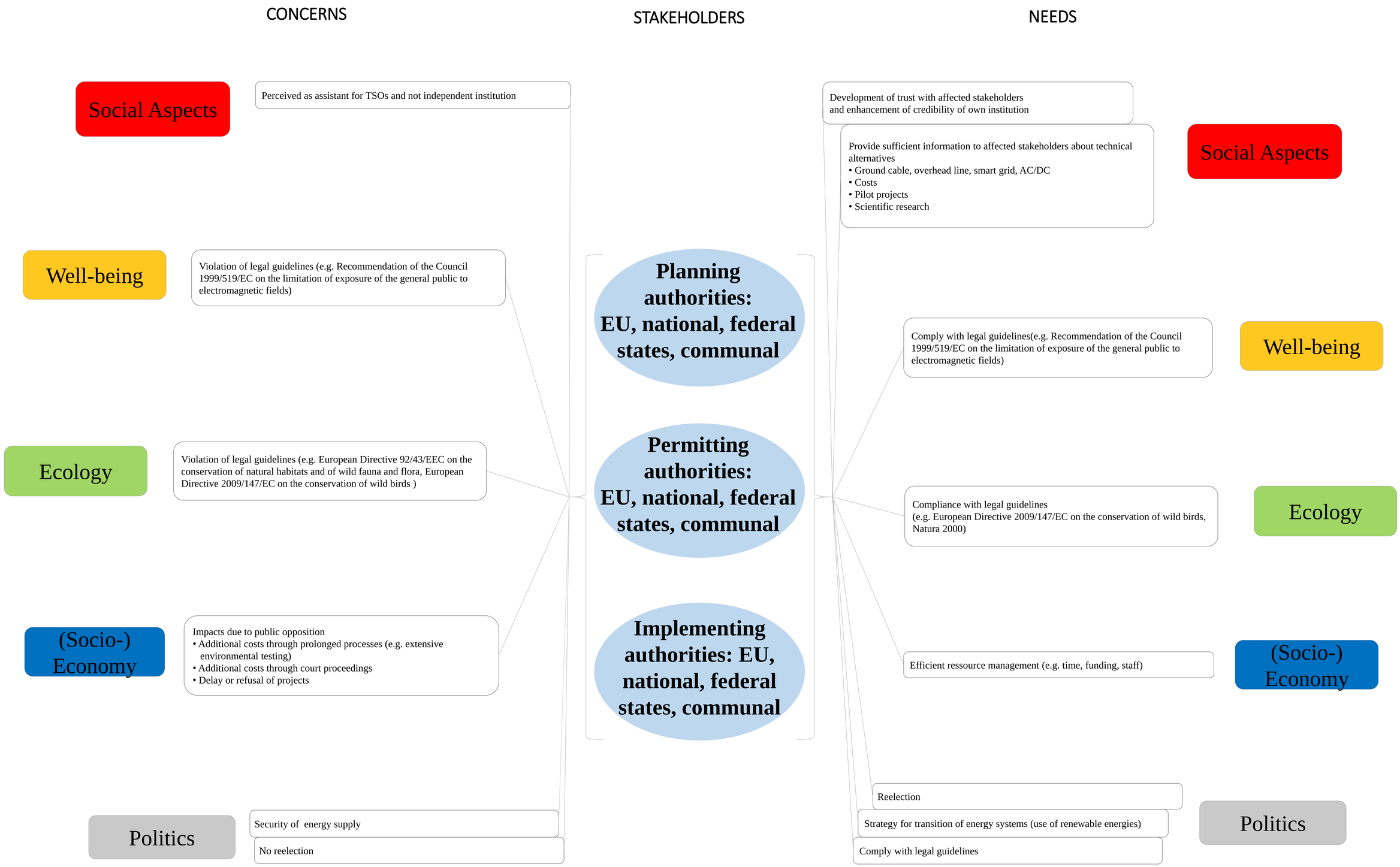

Figure 4. Planning, Permitting and Implementing Authorities

CONCERNS

STAKEHOLDERS

NEEDS

Social Aspects

TSOs perceive themselves as the only advocate for grid extension on the local level

Well-being

Violation of legal guidelines (e.g. Recommendation of the Council 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields)

Ecology

Violation of legal guidelines (e.g. European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, European Directive 2009/147/EC on the conservation of wild birds)

(Socio-) Economy

Impacts due to public opposition
- Additional costs through prolonged processes (e.g. extensive environmental testing)
- Additional costs through court proceedings
- Delay or refusal of projects

Politics

Security of energy supply

No planning security due to changed energy politics

Grid Operators (TSO/DSO)

Development of trust with affected stakeholders and enhancement of credibility of TSOs

Social Aspects

Provide sufficient information to affected stakeholders about technical alternatives
- Ground cable, overhead line, smart grid, AC/DC
- Costs
- Pilot projects
- Scientific research

Compliance with legal guidelines (e.g. European Directive 2009/147/EC on the conservation of wild birds, Natura 2000)

As little impact as possible through construction and maintenance work of HVTLs regarding fauna, flora, biotope and abiotic factors

Ecology

Limitation of error-proneness (e.g. underground cables)

Entrance and track planning for machinery

Technology

Planning security regarding energy politics

Efficient ressource management (e.g. time, funding, staff)

Reliable economic profits

(Socio-) Economy

Support by politicians within planning process and regarding compensation measures (e.g. for underground cable projects)

Politics

Figure 5. Grid Operators

CONCERNS

STAKEHOLDERS

NEEDS

Social Aspects

Exclusion and intransparency of planning and decision-making process

Well-being

Violation of legal guidelines (e.g. Recommendation of the Council 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields)

Ecology

Violation of legal guidelines (e.g. European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, European Directive 2009/147/EC on the conservation of wild birds)

(Socio-) Economy

Impacts due to public opposition
• Additional costs through prolonged processes (e.g. extensive environmental testing)
• Additional costs through court proceedings
• Delay or refusal of projects

Politics

Security of energy supply

No planning security due to changed energy politics

National and Local Energy Providers

Fair planning process
• (Early) Involvement
• Information
• Consultation
• Consultation
•Cooperation

Social Aspects

Transparency of information
• Early, regular, free, easily accessible and comprehensive information

Development of trust with affected stakeholders and enhancement of credibility of Energy Providers

Compliance with legal guidelines
(e.g. European Directive 2009/147/EC on the conservation of wild birds, Natura 2000)

Ecology

Planning security regarding energy politics

Efficient ressource management (e.g. time, funding, staff)

Reliable economic profits

(Socio-) Economy

Strategy for transition of energy systems (use of renewable energies)

Decentralized energy supply instead of large-scale grid expansion

Politics

Figure 6. National and Local Energy Providers

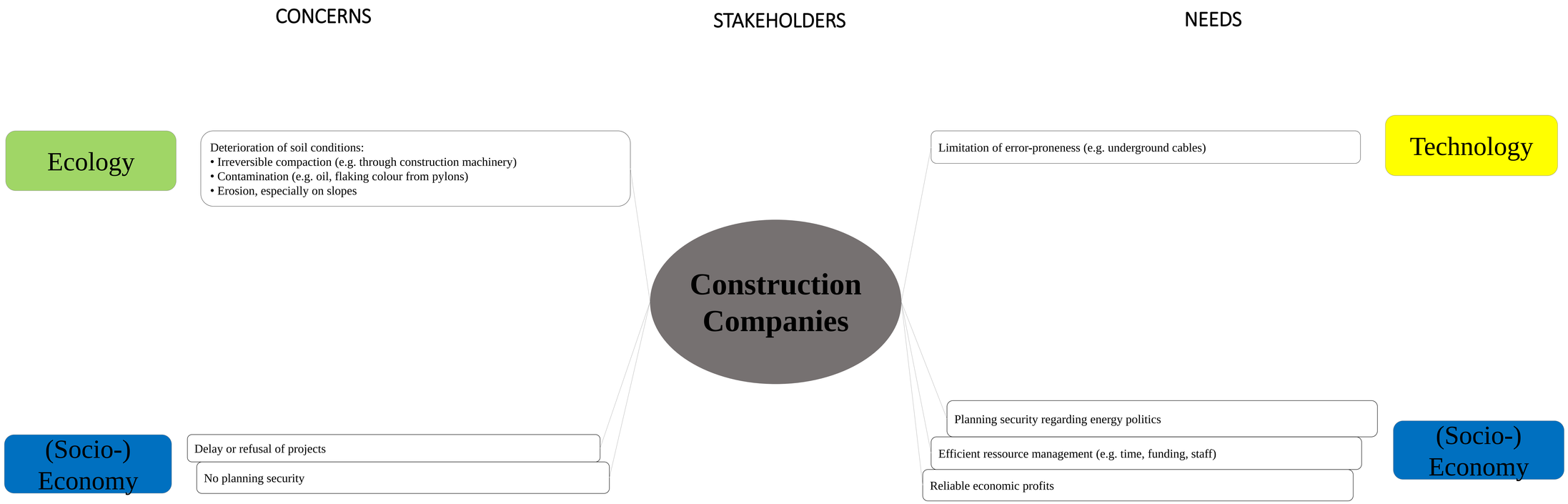

Figure 7. Construction Companies

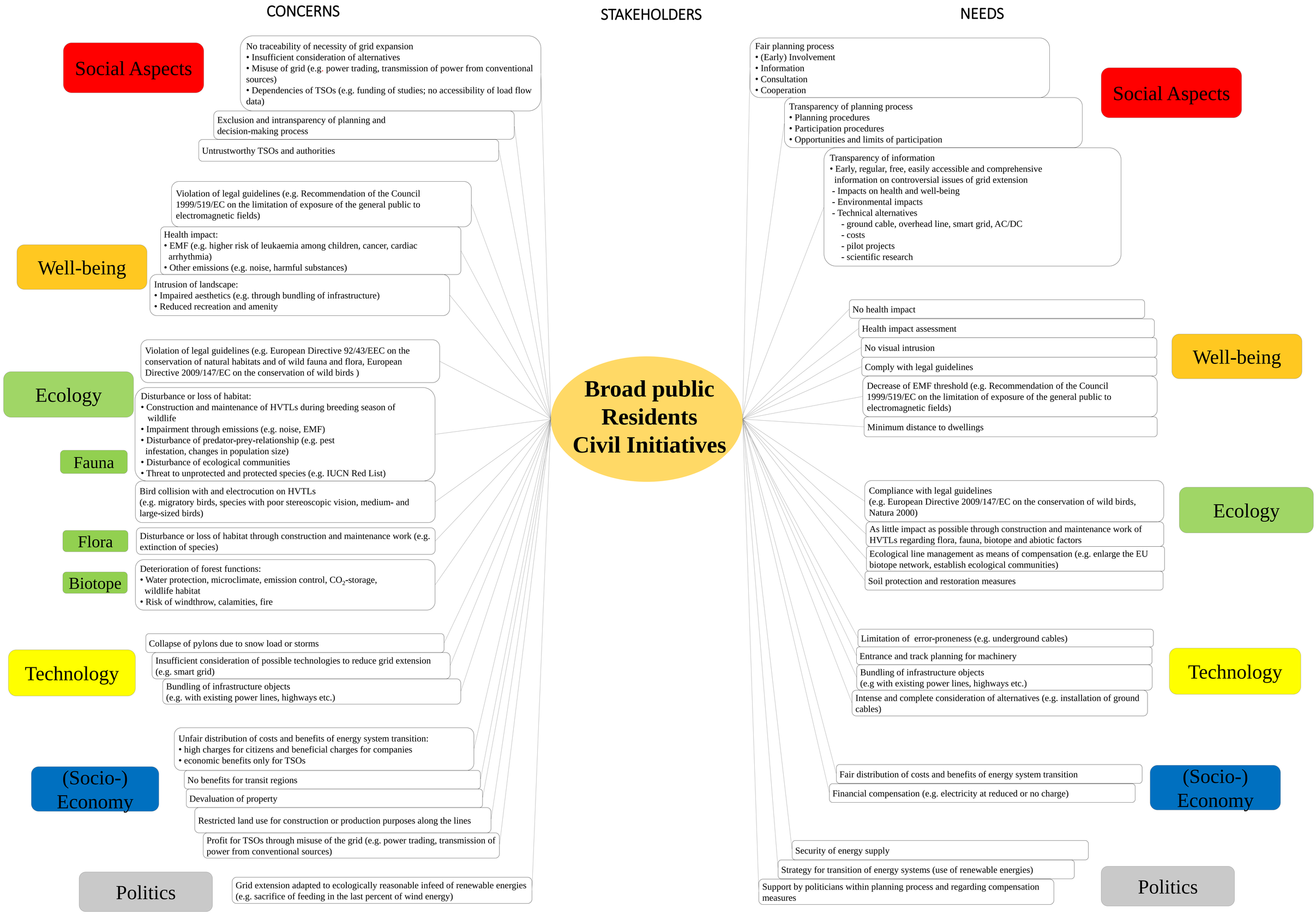

Figure 8. Broad Public, Residents and Civil Initiatives

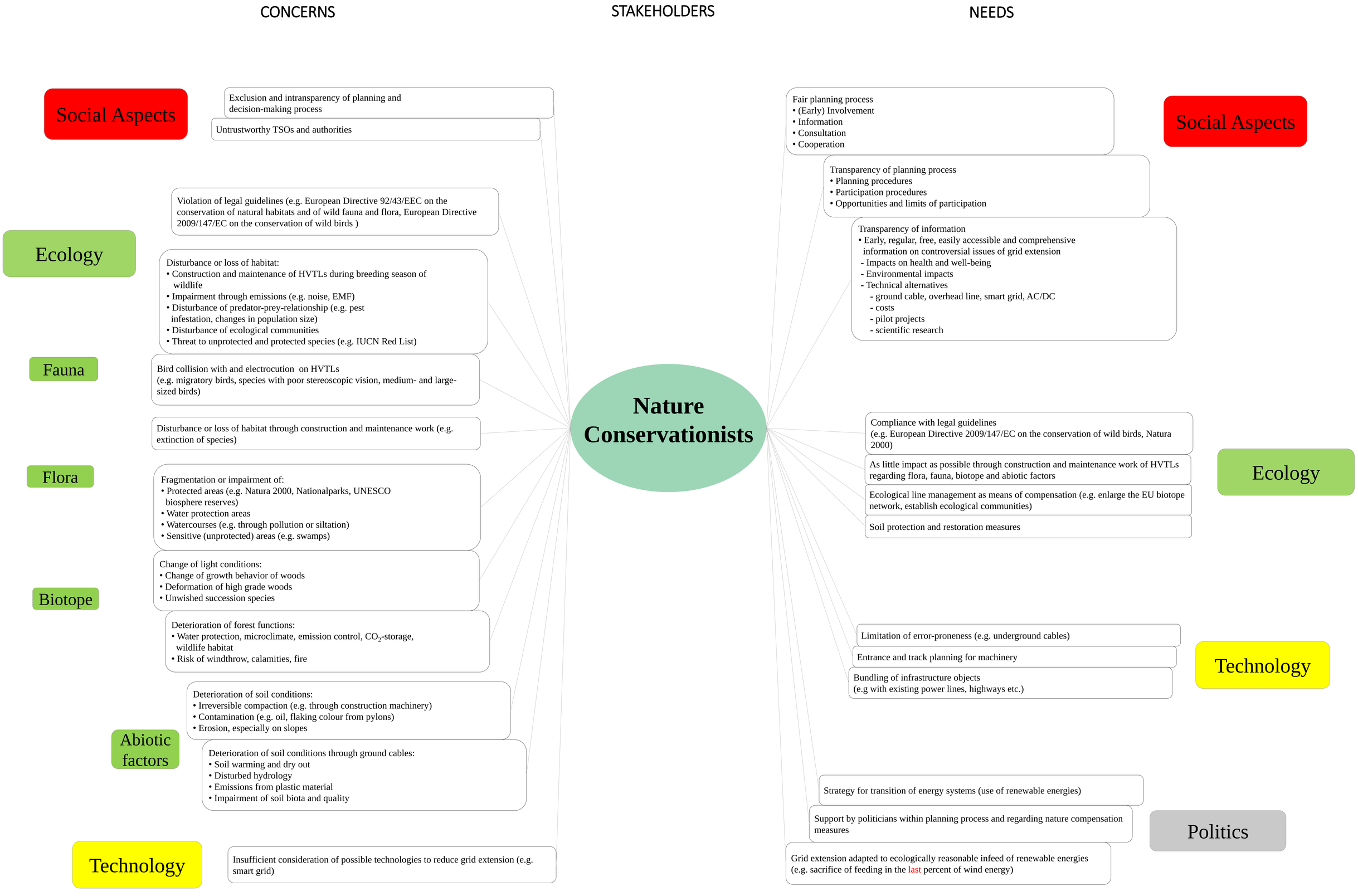

Figure 9. National Conservationists

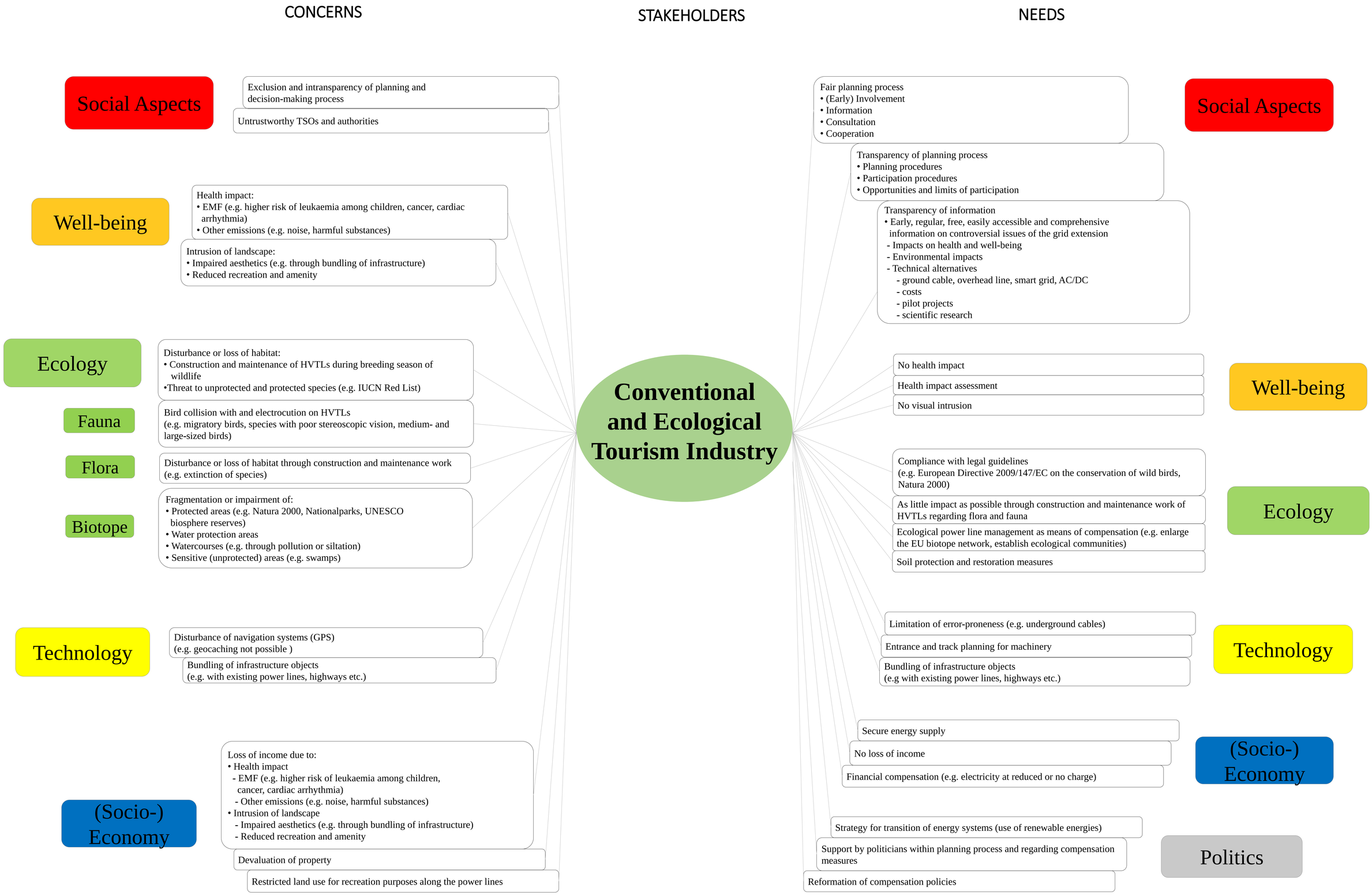

Figure 10. Conventional and Ecological Tourism Industry

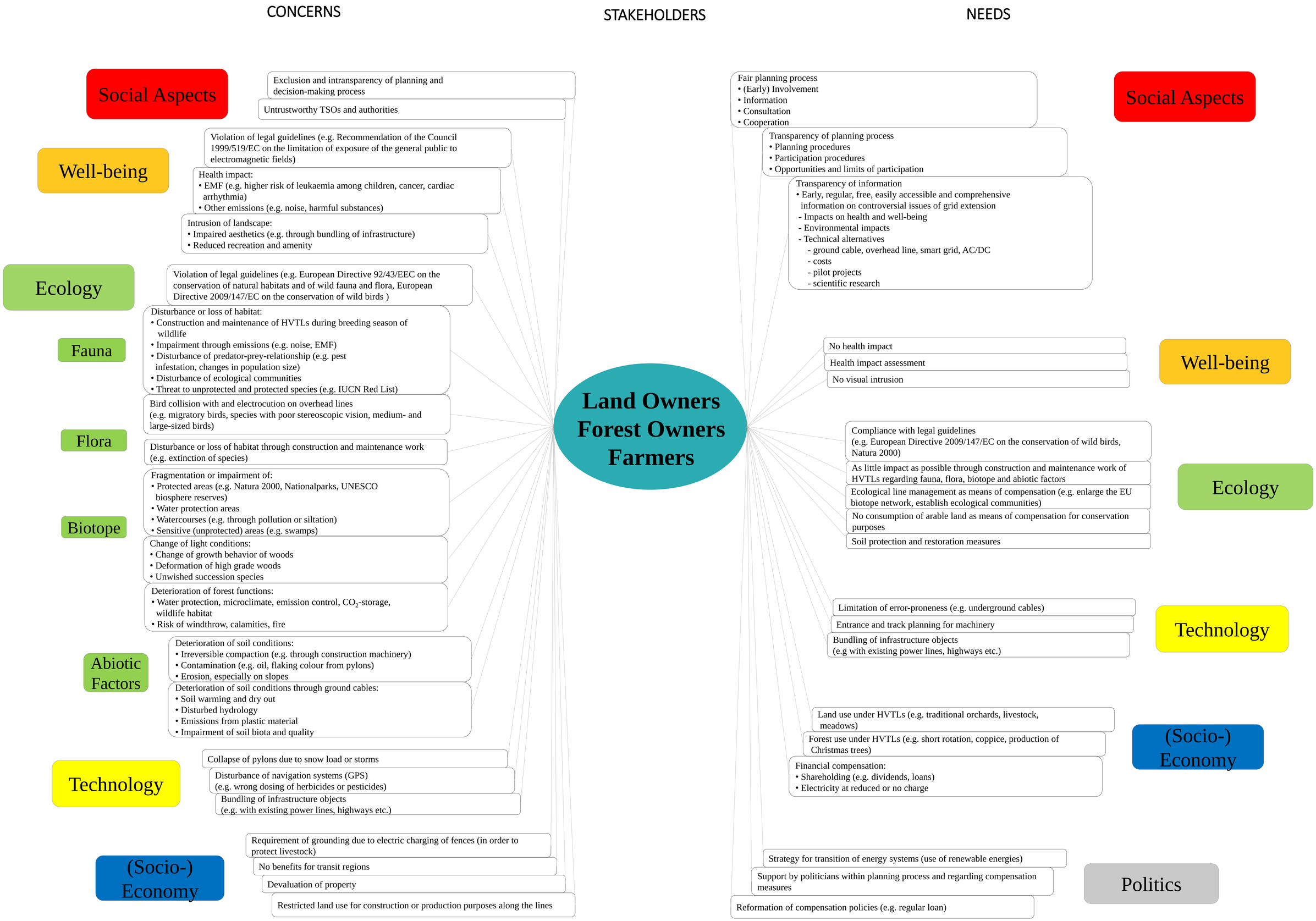

Figure 11. Land Owners, Forest Owners and Farmers

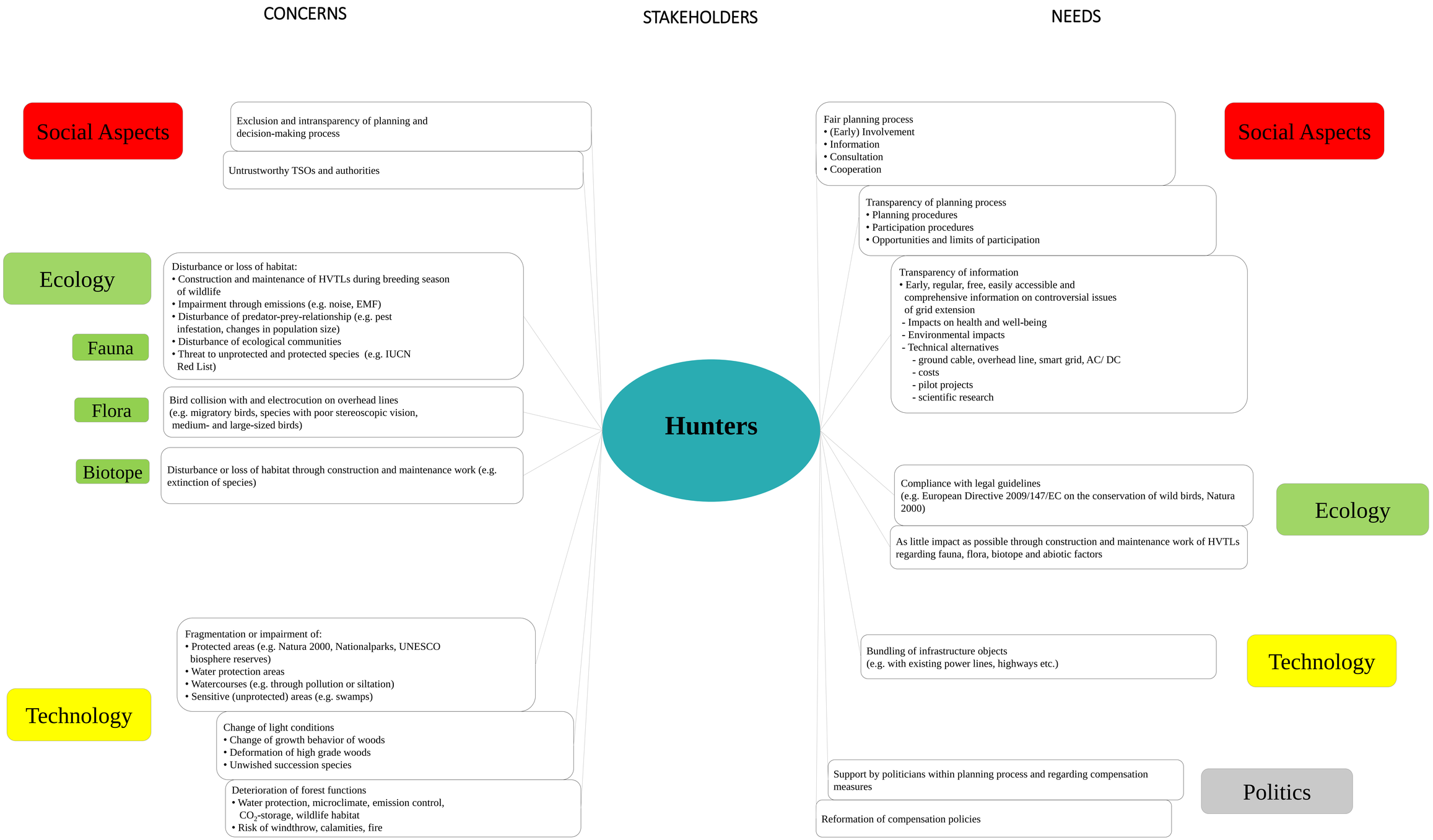

Figure 12. Hunters

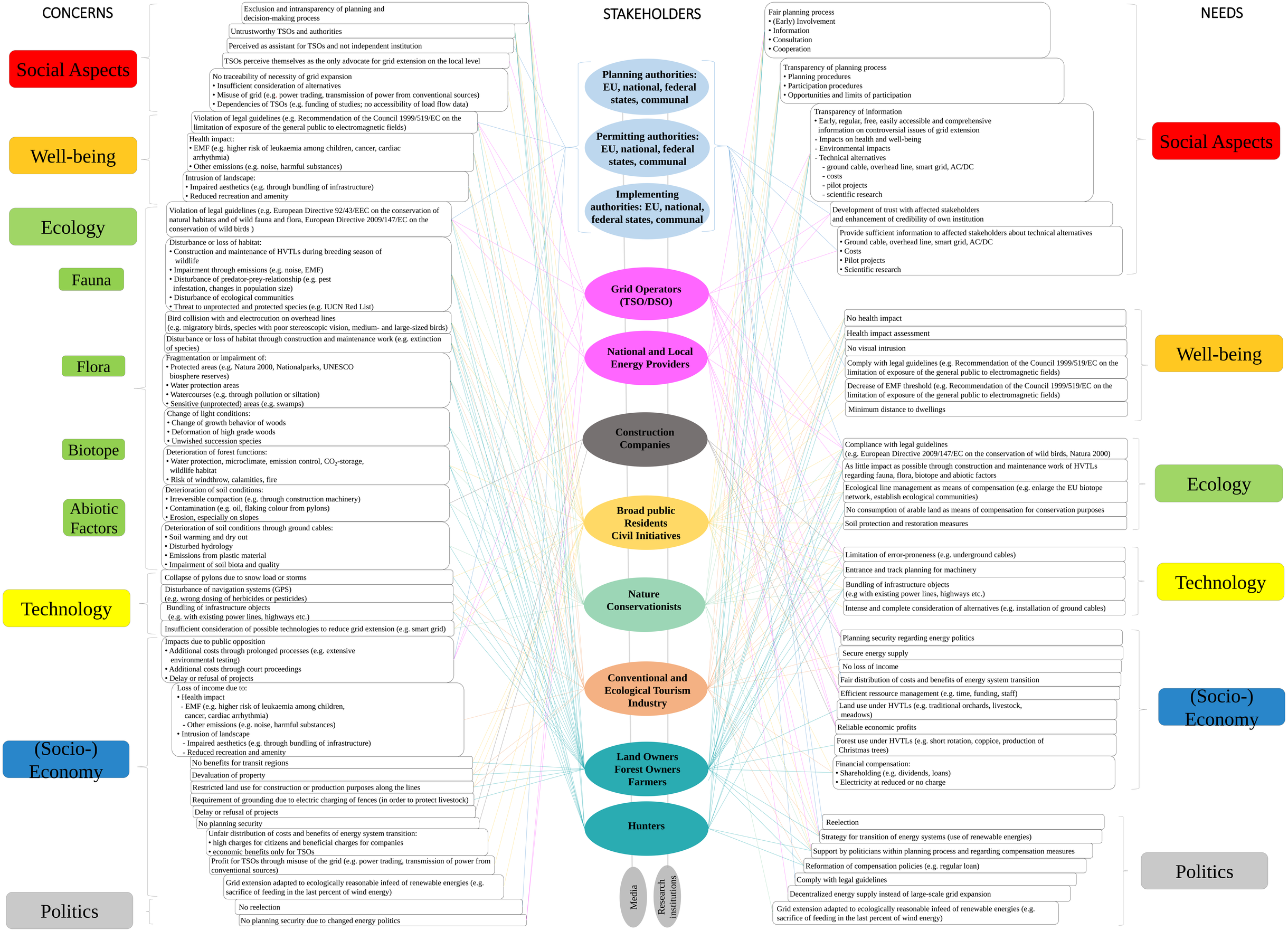

Figure 13. Joint Stakeholder Map

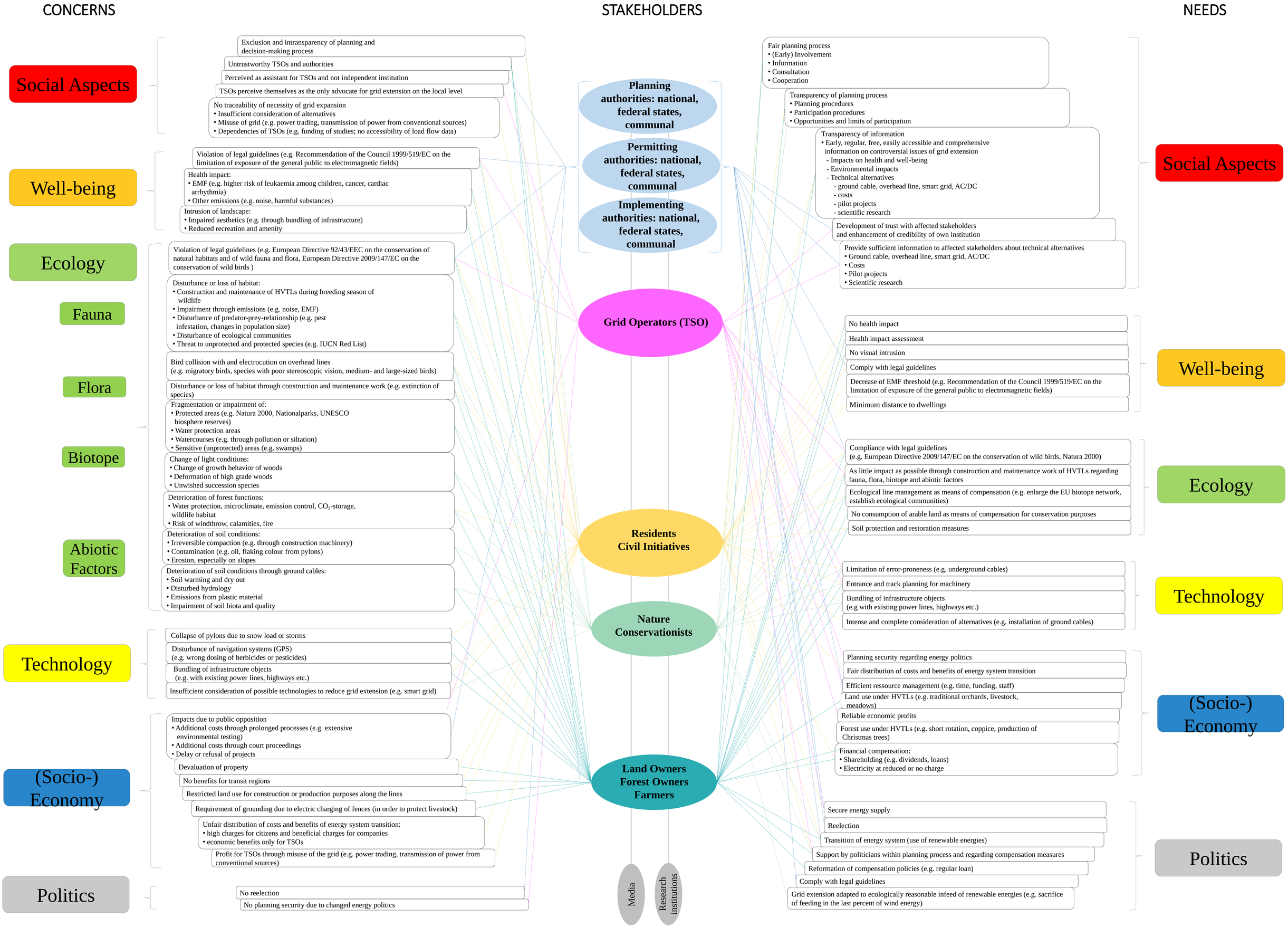

Figure 14. Stakeholder Map for a Specific Region

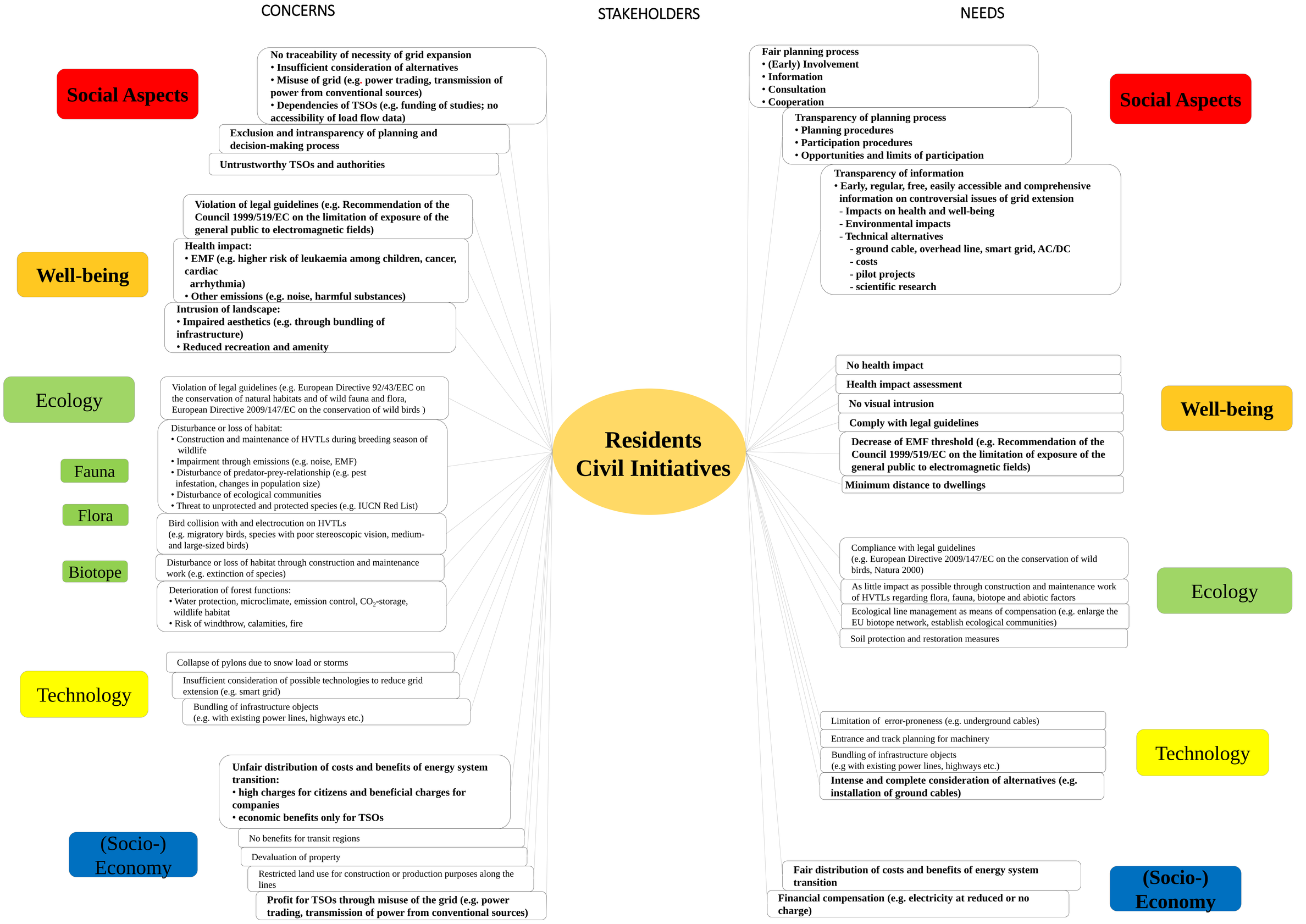

Figure 15. Concerns and Needs of Residents and CIs in a Specific Region

CONCERNS		NEEDS
• Exclusion and intransparency of planning and decision-making process • Untrustworthy TSOs and authorities • Perceived as assitant for TSOs and not independent institution • TSOs perceive themselves as the only advocate for grid extension on the local level • No traceability of necessity of grid expansion - Insufficient consideration of alternatives - Misuse of grid (e.g. power trading, transmission of power from conventional sources) - Dependencies of TSOs (e.g. funding of studies, no accessibility of load flow data)	Social Aspects	• Fairly planning process (Early Involvement, Information, Consultation, Cooperation) • Transparency of planning process (Planning procedures, Participation procedures, Opportunities and limits of participation) • Transparency of information (early, regular, free, easily accessible and comprehensive information on controversial issues of grid extension): - impacts on health and well-being - environmental impacts - technical alternatives (ground cable, overhead line, smart grid, AC/DC; costs; pilot projects; scientific research) • Development of trust with affected stakeholders and enhancement of credibility of own institution • Provide sufficient information to affected stakeholders about technical alternatives (ground cable, overhead lines, smart grid, AC/DC; costs; pilot projects; scientific research)
• Violation of legal guidelines (e.g. Recommendation of the Council 1995/519/EC on the limitation of exposure of the general public to electromagnetic fields) • Health impact: - EMF (e..g. higher risk of leukaemia among children, cancer, cardiac arrhythmia) - Other emissions (e.g. noise, harmful substances) • Intrusion of landscape: - Impaired aesthetics (e.g. through bundling of infrastructure) - Reduced recreation and amenity	Well-being	• No health impact • Health impact assessment • No visual intrusion • Comply with legal guidelines (e.g. Recommendation of the Council 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields) • Decrease of EMF threshold (e.g. Recommendation of the Council 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields) • Minimum distance to dwellings
• Violation of legal guidelines (e.g. European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, European Directive 2009/147/EC on the conservation of wild birds) • Disturbance or loss of habitat: - Construction and maintenance of HVTLs during breeding season of wildlife, - Impairment through immissions (e.g. noise, EMF) - Disturbance of predator-prey-relationship (e.g. pest infestation, changes in population size), - Disturbance of ecological communities - Threat to unprotected and protected species (e.g. IUCN Red List) • Bird collision with and electrocution on overhead lines (e.g. migratory birds, species with poor stereoscopic vision, medium- and large-sized birds) • Disturbance or loss of habitat through construction and maintenance work (e.g. extinction of species) • Fragmentation or impairment of: - Protected areas (e.g. Natura 2000, Nationalparks, UNESCO biosphere reserves) - Water protection areas and watercourses (e.g. through pollution or siltation) - Sensitive (unprotected) areas (e.g. swamps) • Change of light conditions: - Change of growth behavior of woods - Deformation of high grade woods - Unwished succession species • Deterioration of forest functions: - Water protection, microclimate, emission control, CO_2-storage, wildlife habitat - Risk of windthrow, calamities, fire • Deterioration of soil conditions: - Irreversible compaction (e.g. through construction machinery) - Contamination (e.g. oil, flaking colour from pylons) - Erosion, especially on slopes • Deterioration of soil conditions through ground cables - Soil warming and dry out - Disturbed hydrology - Emissions from plastic material - Impairment of soil biota and quality	Ecology	• Compliance with legal guidelines (e.g. European Directive 2009/147/EC on the conservation of wild birds, Natura 2000) • As little impact as possible through construction and maintenance work of HVTLs regarding fauna, flora, biotope and abiotic factors • Ecological line management as means of compensation (e.g. enlarge the EU biotope network, establish ecological communities) • No consumption of arable land as means of compensation for conservation purposes • Soil protection and restoration measures
• Collapse of pylons due to snow load or storms • Disturbance of navigation systems (GPS) (e.g. wrong dosing of herbicides or pesticides) • Bundling of infrastructure objects (e.g. with existing power lines, highways etc.) • Insufficient consideration of possible technologies to reduce grid extension (e.g. smart grid)	Technology	• Limitation of error-proneness (e.g. underground cables) • Entrance and track planning for machinery • Bundling of infrastructure objects (e.g with existing power lines, highways etc.) • Intense and complete consideration of alternatives (e.g. installation of ground cables)
• Impacts due to public opposition - Additional costs through prolonged processes (e.g. extensive environmental testing) - Additional costs through court - Delay or refusal of projects • Loss of income due to: - Health impact: EMF (e.g. higher risk of leukaemia among children, cancer, cardiac arrhythmia), other emissions (e.g. noise, harmful substances) - Intrusion of landscape: Impaired aesthetics (e.g. through bundling of infrastructure), reduced recreation and amenity • No benefits for transit regions • Devaluation of property • Delay or refusal of projects • No planning security • Restricted land use for construction or production purposes along the lines • Requirement of grounding due to electric charging of fences (in order to protect livestock) • Profit for TSOs through misuse of the grid (e.g. power trading, transmission of power from conventional sources) • Unfair distribution of costs and benefits of energy system transition: - high charges for citizens and beneficial charges for companies - economic benefits only for TSOs	(Socio-) Economy	• Planning security regarding energy politics • Secure energy supply • No loss of income • Fair distribution of costs and benefits of energy system transition • Efficient resource management (e.g. time, funding, staff) • Land use under HVTLs (e.g. traditional orchards, livestock, meadows) • Forest use under HVTLs (e.g. short rotation, coppice, production of Christmas trees) • Reliable economic profits • Financial compensation: - Shareholding (e.g. dividends, loans) - Electricity at reduced or no charge
• Grid extension adapted to ecologically reasonable infeed of renewable energies (e.g. sacrifice of feeding in the last percent of wind energy) • No reelection • No planning security due to changed energy politics	Politics	• Secure energy supply • Reelection • Transition of energy system (use of renewable energies) • Support by politicians within planning process and regarding compensation measures • Reformation of compensation policies (e.g. regular loan) • Comply with legal guidelines • Decentralized energy supply instead of large-scale grid expansion • Grid extension adapted to ecologically reasonable infeed of renewable energies (e.g. sacrifice of feeding in the last percent of wind energy)

Figure 18. Overview over all Concerns and Needs