Recommendations for Landscape Development through Renewable Energy Infrastructures in Switzerland

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Energy Turnaround and Landscape

- Energy Strategy 2050
  → Increase the use of renewable energy

- The required energy infrastructures change the landscape

Source: BFE 2018. Slide presentation: Energy strategy 2050 once the new energy act is in force.
Conflicts

• The perceived landscape impact of renewable energy infrastructures influences the social acceptance

→ How can the landscape perspective of social acceptance be better taken into account in renewable energy infrastructure projects?

Source: LinthGegenwind, https://www.linthgegenwind.ch/werbeaktion
Conceptual model of the influences of different aspects on the preferences

Landscape

- Attitudes towards the environment, Environmental values, General landscape preferences
- Information & Connotations to landscapes

- Perception of the landscape structure
- Physiological responses to the landscape scene

Renewable Energy Infrastructures

- Knowledge and values about energy and energy changes
- Information & Connotations to energy infrastructures

Preferences for scenarios Energy Landscape
Stimulus

Choice made on the question:
«Which picture do you like better?»

non-representative
local laboratory experiment:
physiological & cognitive

Choice made on the question:
«Which picture do you choose?»

Swiss-wide representative
online panel survey:
cognitive

Additional information

Cognitive judgement

Costs

values
social
own
experience

CO2 reduction

Preference Study
Character Landscapes

- Urbanized Plateau
- Agricultural Plateau
- Jura
- Pre-Alps
- Urbanized Alpine Areas
- Touristic Alpine Areas
- Alpine Areas with Infrastructure
- Further Alpine Areas

Core Cities
Lakes
3D Visualization based on Point Clouds

3D Terrestrial Laser Scanner
RIEGL VZ-1000

Orthofoto
Höhenmodell
3D-Objekte
Punktwolke
Scenarios – No Renewable Energy Infrastructures
Scenarios – Few Renewable Energy Infrastructures
Scenarios – Many Renewable Energy Infrastructures
Scenarios – Many Renewable Energy Infrastructures
Scenarios – Many Renewable Energy Infrastructures
Scenarios – Few Renewable Energy Infrastructures
Scenarios – Few Renewable Energy Infrastructures
Scenarios – Many Renewable Energy Infrastructures
Scenarios – Many Renewable Energy Infrastructures
Landscape type and existing impacts play an important role

Judged most positively:

«Urbanized Plateau»

«Touristic Alpine Areas»

«Further Alpine Areas»

Renewable energy infrastructures are currently rather not desired in near-natural «Further Alpine Areas». 
The Judgment of the Scenarios

Urbanized Plateau
Agricultural Plateau
Jura
Pre-Alps
Urbanized Alpine Areas
Touristic Alpine Areas
Further Alpine Areas
The Judgment of the Scenarios

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Landscape changes through photovoltaic systems are rated positively …
… but not on open spaces
Useful combinations of different types of energy systems are appreciated
The amount of renewable energy infrastructures influences the physiological responses

The differences in skin conductance indicate how much a person's arousal or attention changes when viewing the landscape scenarios.
Perception of the Landscape Structure
... are inferred

«This landscape is clearly arranged.»

«I would like to get to know this landscape better.»

Making Sense

Involvement

«This landscape is coherent.»

«There are many different things in this landscape.»

... are directly perceived
The amount of renewable energy infrastructures influences the perceived coherence.
Conclusion and Outlook

Landscape Perspective

• Findings can help to better incorporate the views of the population in spatial planning activities
• Valuable basis for developing strategies for landscape development with renewable energy systems

Snapshot of the Judgment

• Results show how possible landscape developments through renewable energy infrastructures are judged today
• Judgment of the scenarios can (possibly quite quickly) change → Longitudinal studies to investigate such processes of change
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