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Meta-analyses of the recent energy strategic planning in the framework of sustainability assessment. A review.

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CORFU 2022 Conference

PRESENTATION CONTENTS

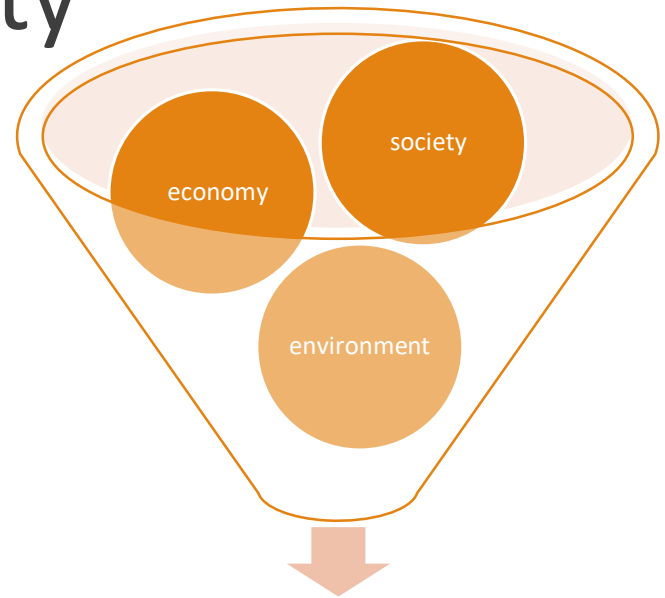
1. PURPOSE
2. METHOD
3. RESULTS
4. CONCLUSIONS

PURPOSE

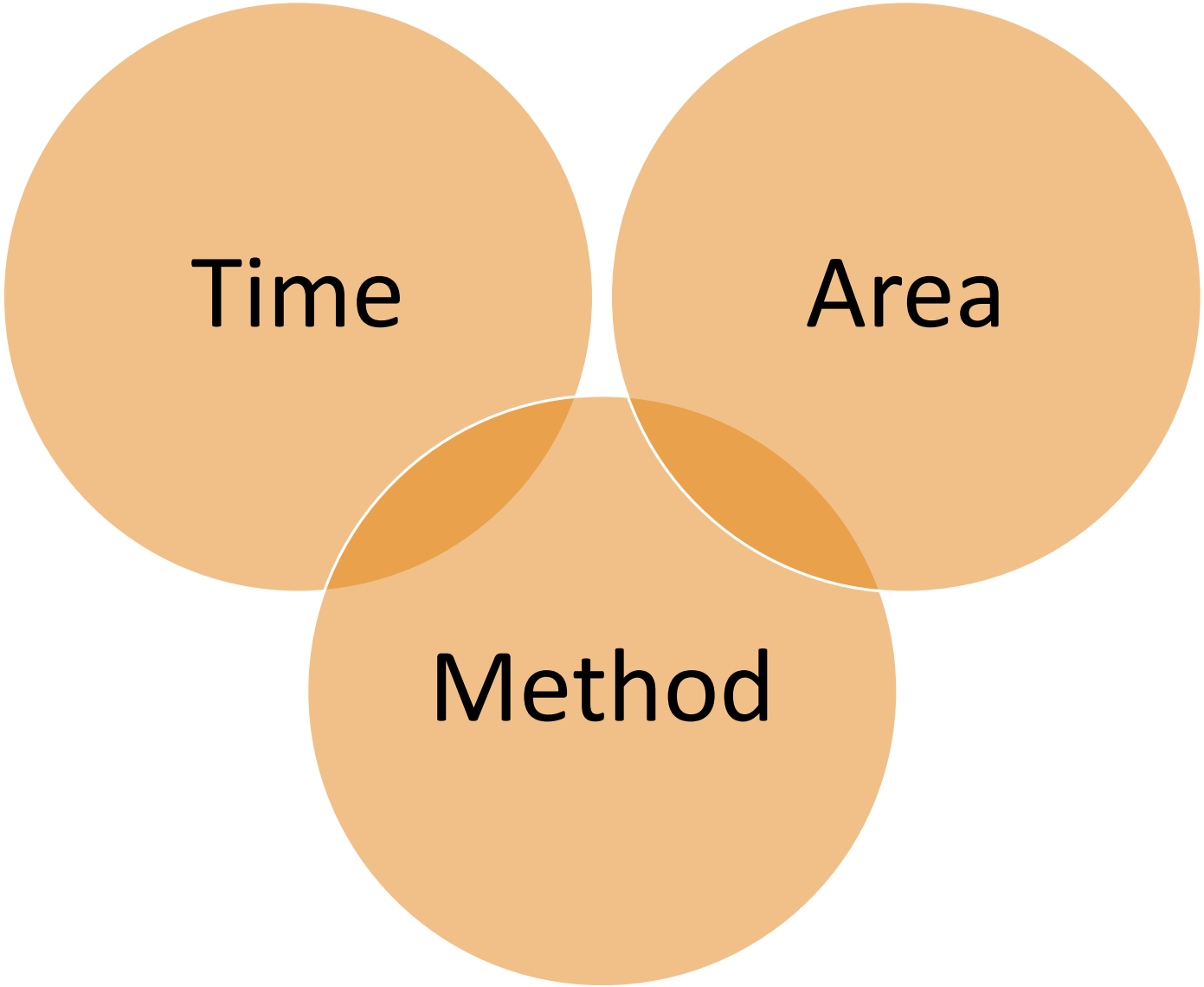
- ✓Energy is necessary for life and development
- ✓There is a variety of available energy sources, renewable and non renewable
- ✓Energy is a key element of sustainable development
- ✓Energy production and consumption is connected to several concerns.
- ✓Energy strategic planning is important to ensure sustainability
- ✓ When the planning is sustainable and how this can be evaluated?

PURPOSE

A systematic review and meta - analyses of the literature dealing with energy strategic planning and the evaluation of its sustainability

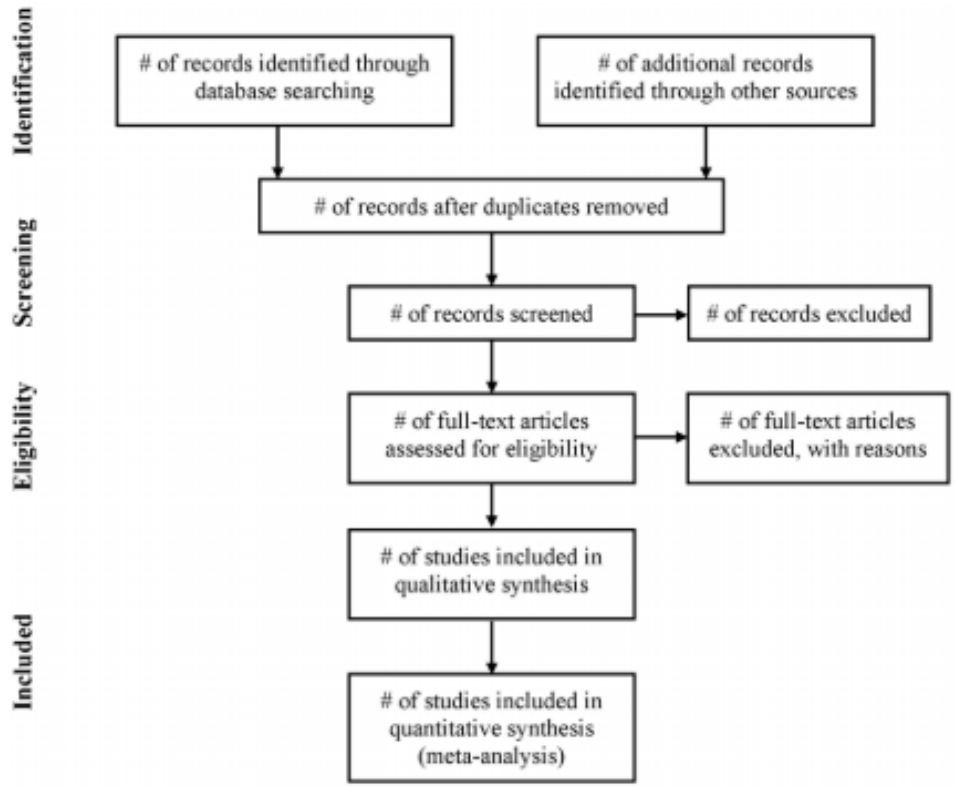


ANALYSES CRITERIA



REVIEW METHOD

Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021)



Page MJ, McKenzie JE, Bossuyt PM, et al (2021) The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ 372:. https://doi.org/10.1136/bmj.n71

REVIEW METHOD

Scopus Database

Search Terms: "energy planning" OR

"energy strategy" OR

"energy policy" AND

sustainability OR assessment OR evaluation

Inclusion criteria:

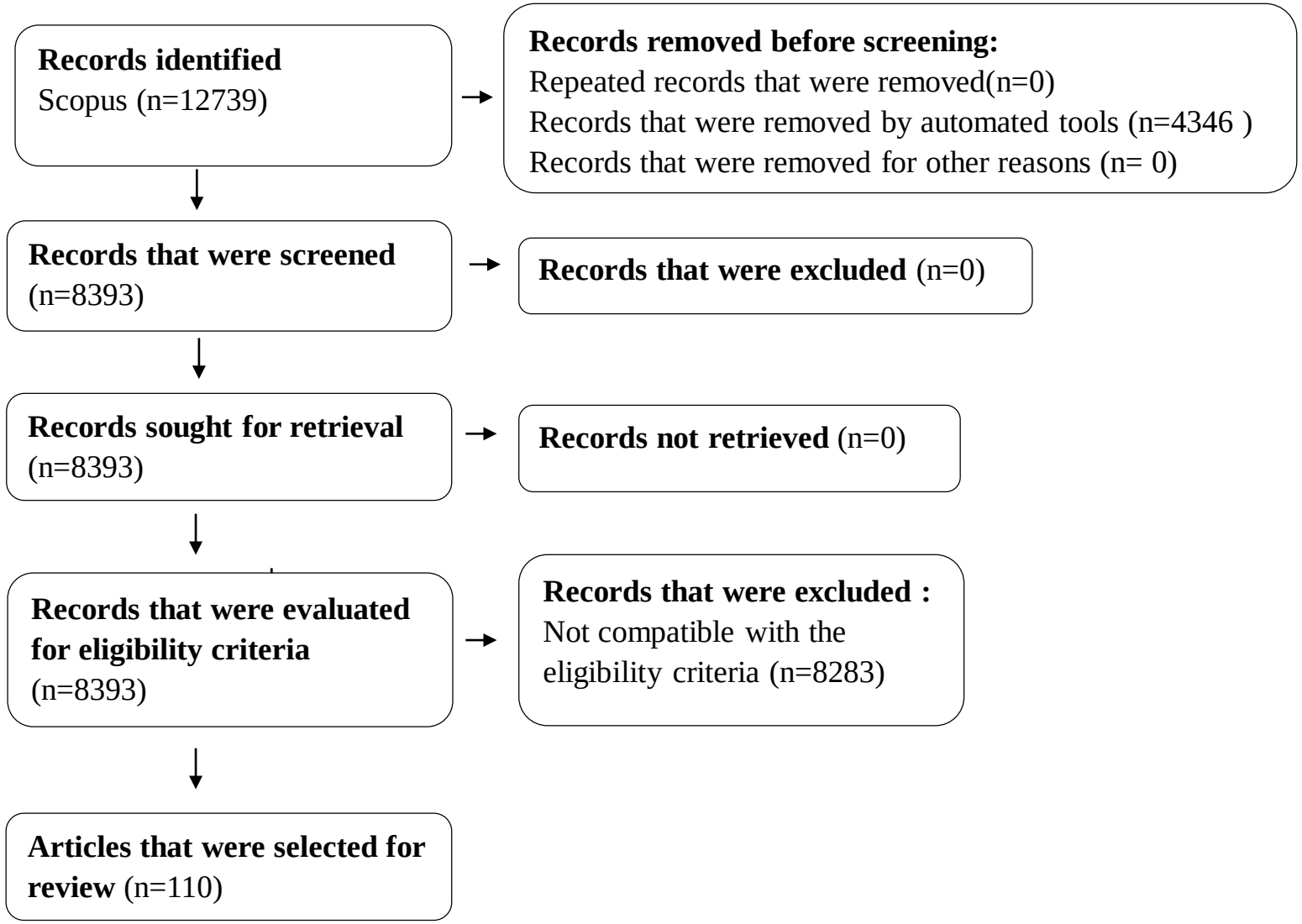
Document type: Article

Language: English

Eligibility criteria:

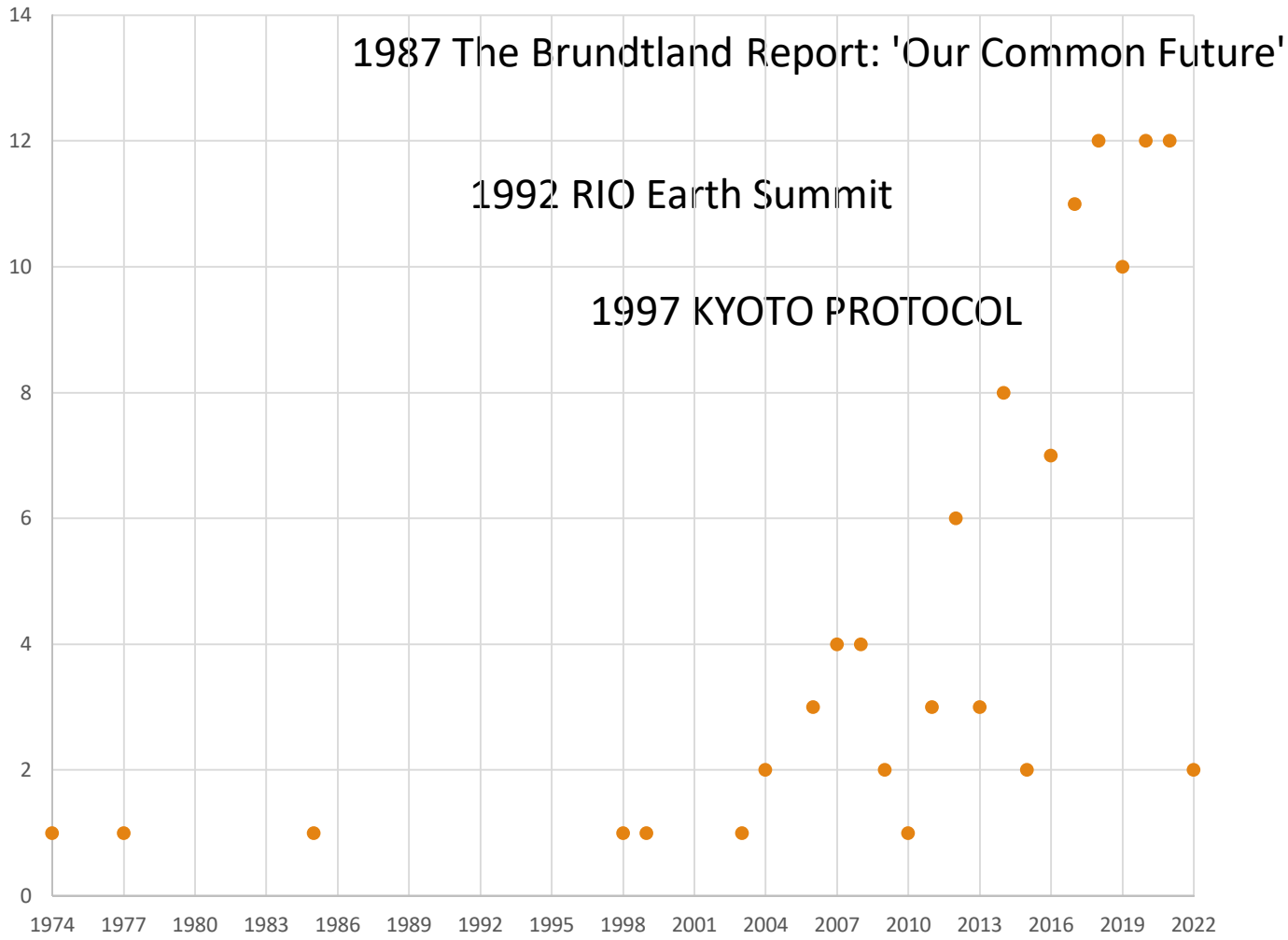
- Evaluation of energy strategies, plans or policies
- Sustainability assessment (either environmental, economic or social)
- Not limited to local level
- Not limited to energy sources, specific applications or technologies
- Not for energy planning methods

RESULTS


Records identified
Scopus (n=12739)
Records removed before screening:
Repeated records that were removed(n=0)
Records that were removed by automated tools (n=4346)
Records that were removed for other reasons (n= 0)
Records that were screened
(n=8393)
Records that were excluded (n=0)
Records sought for retrieval
(n=8393)
Records not retrieved (n=0)
Records that were evaluated for eligibility criteria
(n=8393)
Records that were excluded :
Not compatible with the eligibility criteria (n=8283)
Articles that were selected for review (n=110)

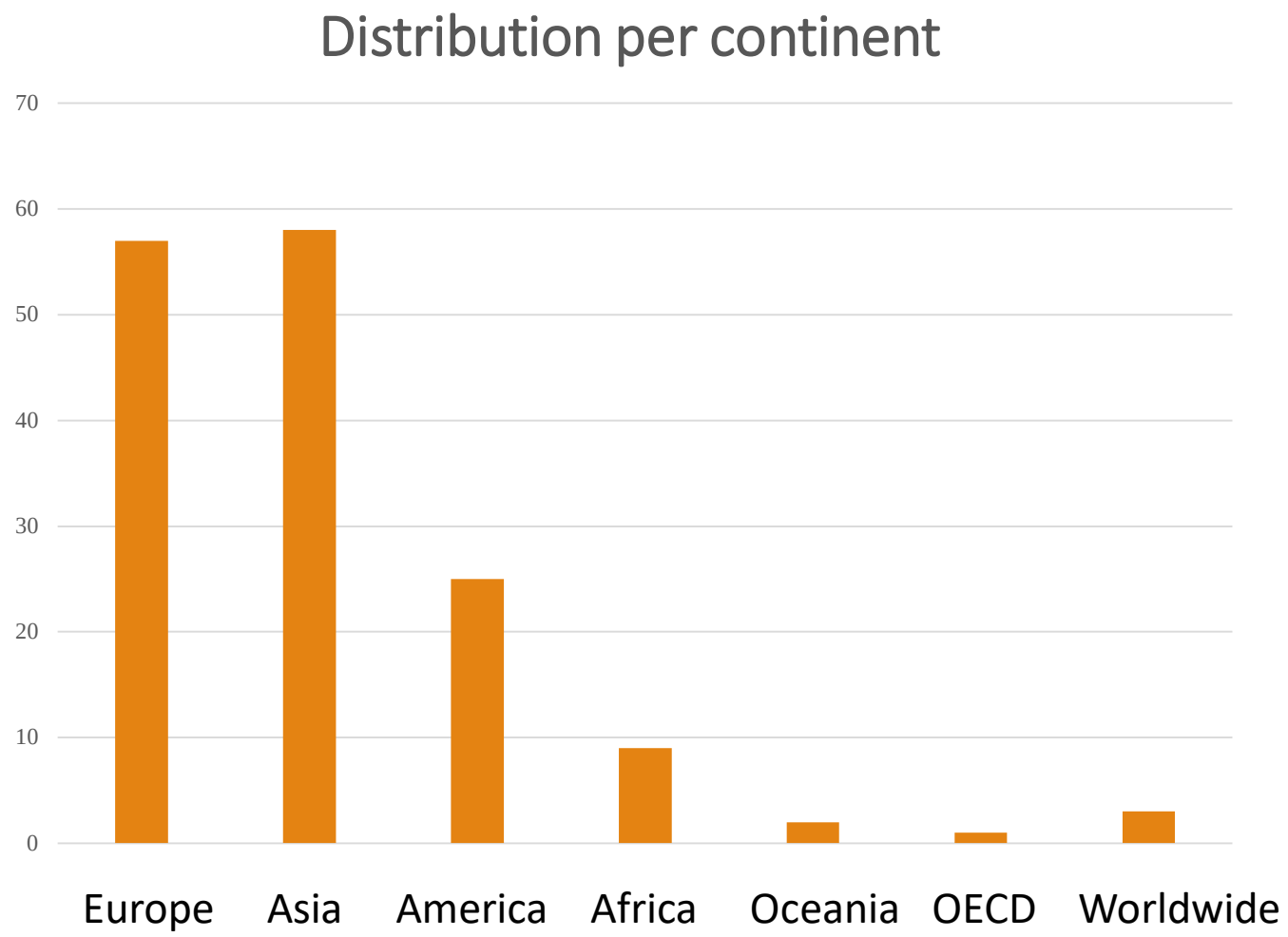
RESULTS

Publications per year



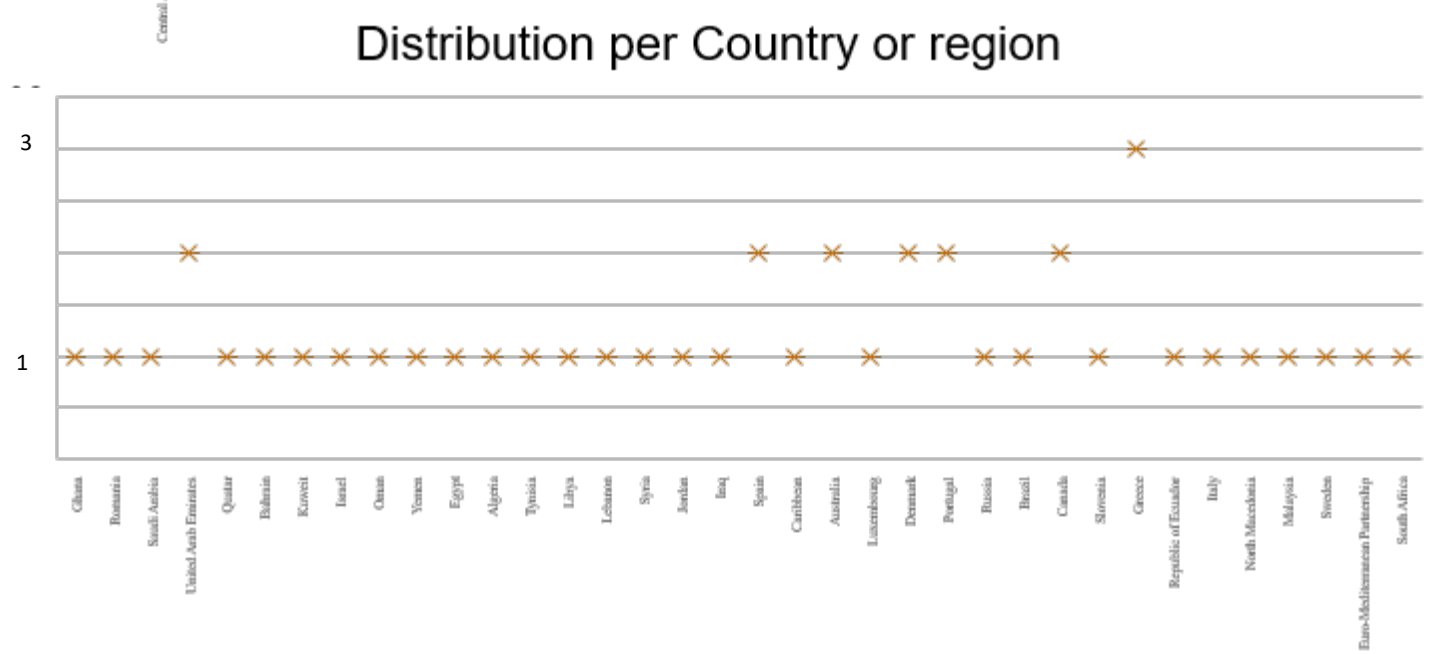
RESULTS

Spatial distribution



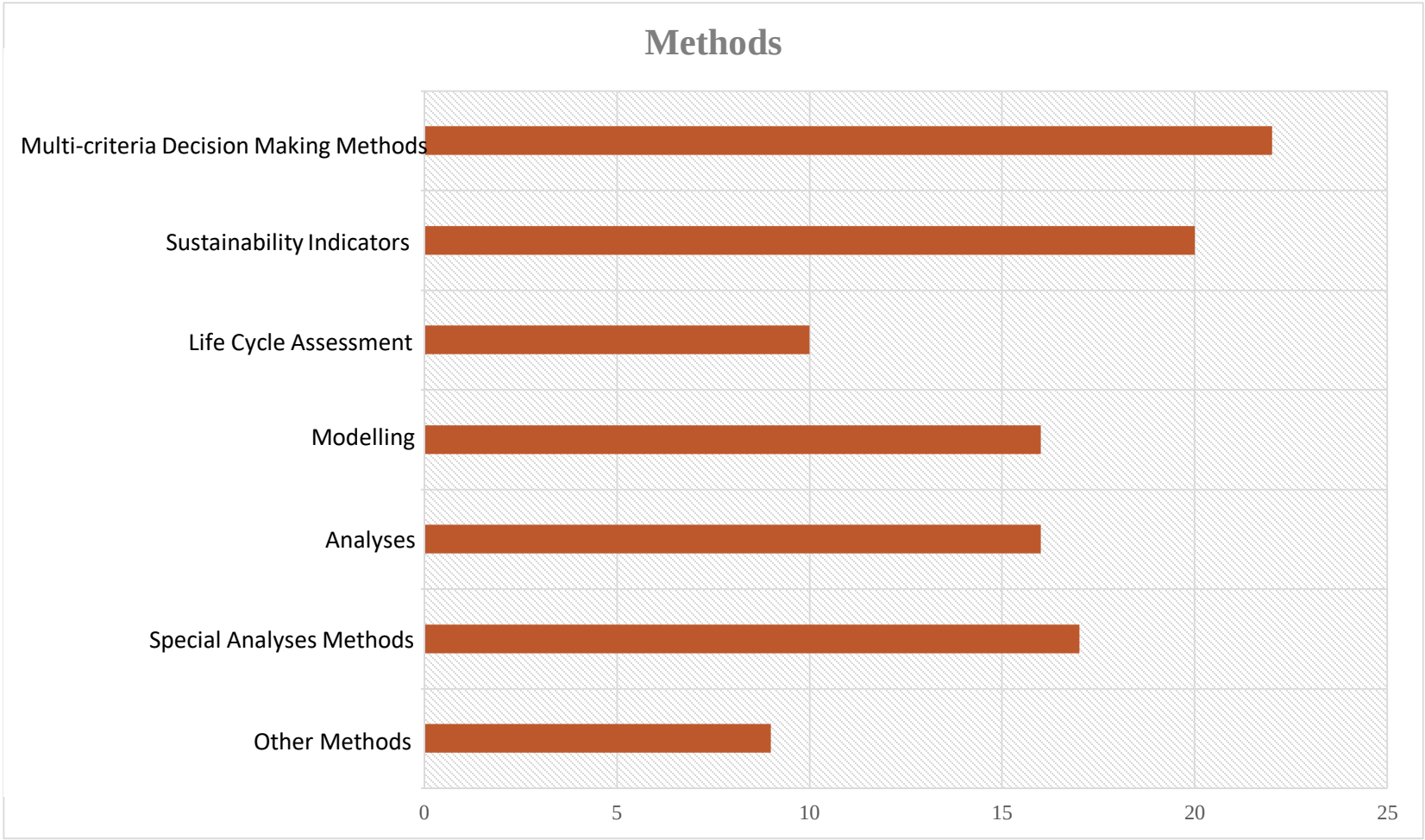
RESULTS

Spatial distribution



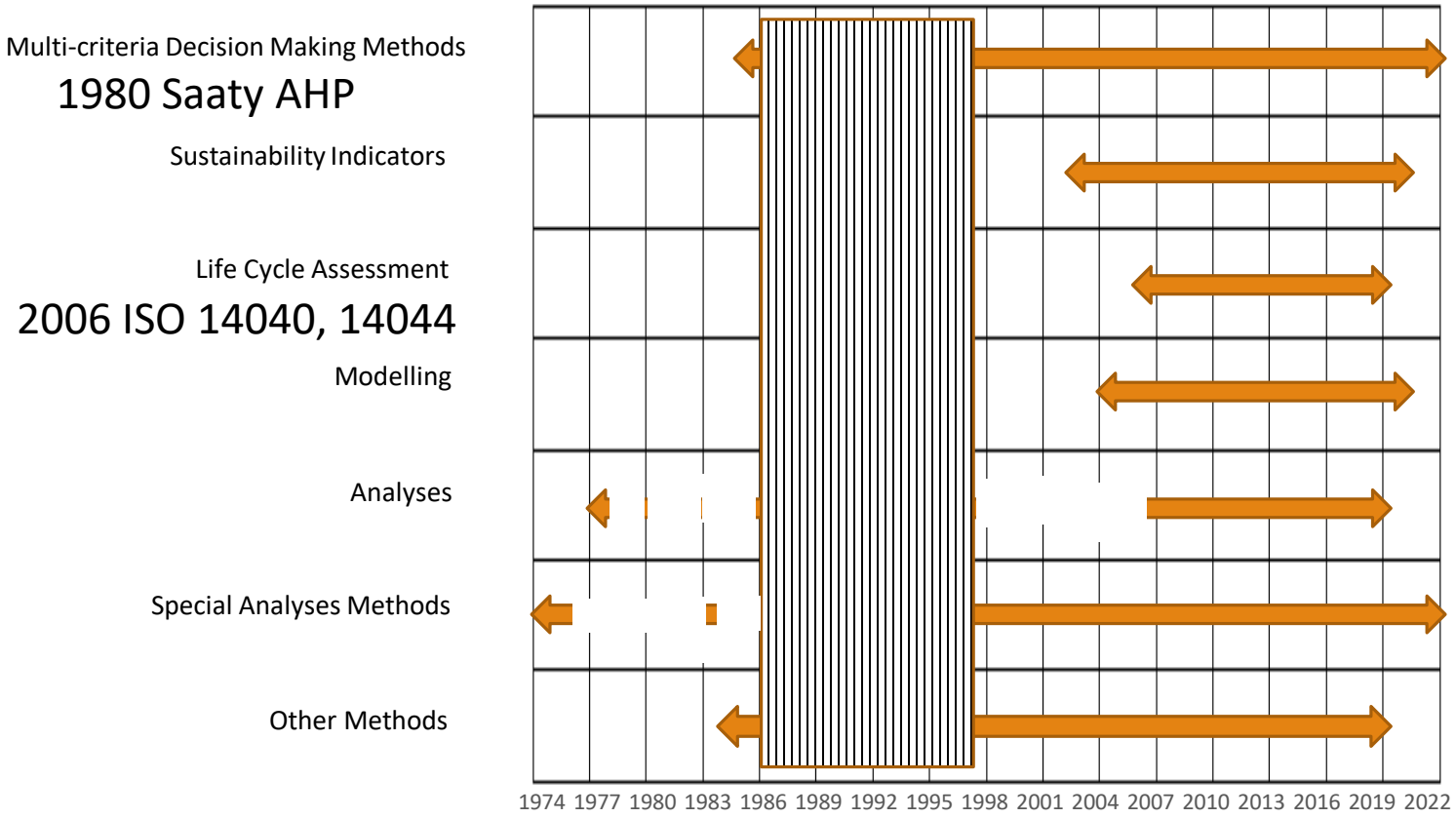
RESULTS

Evaluation Methods



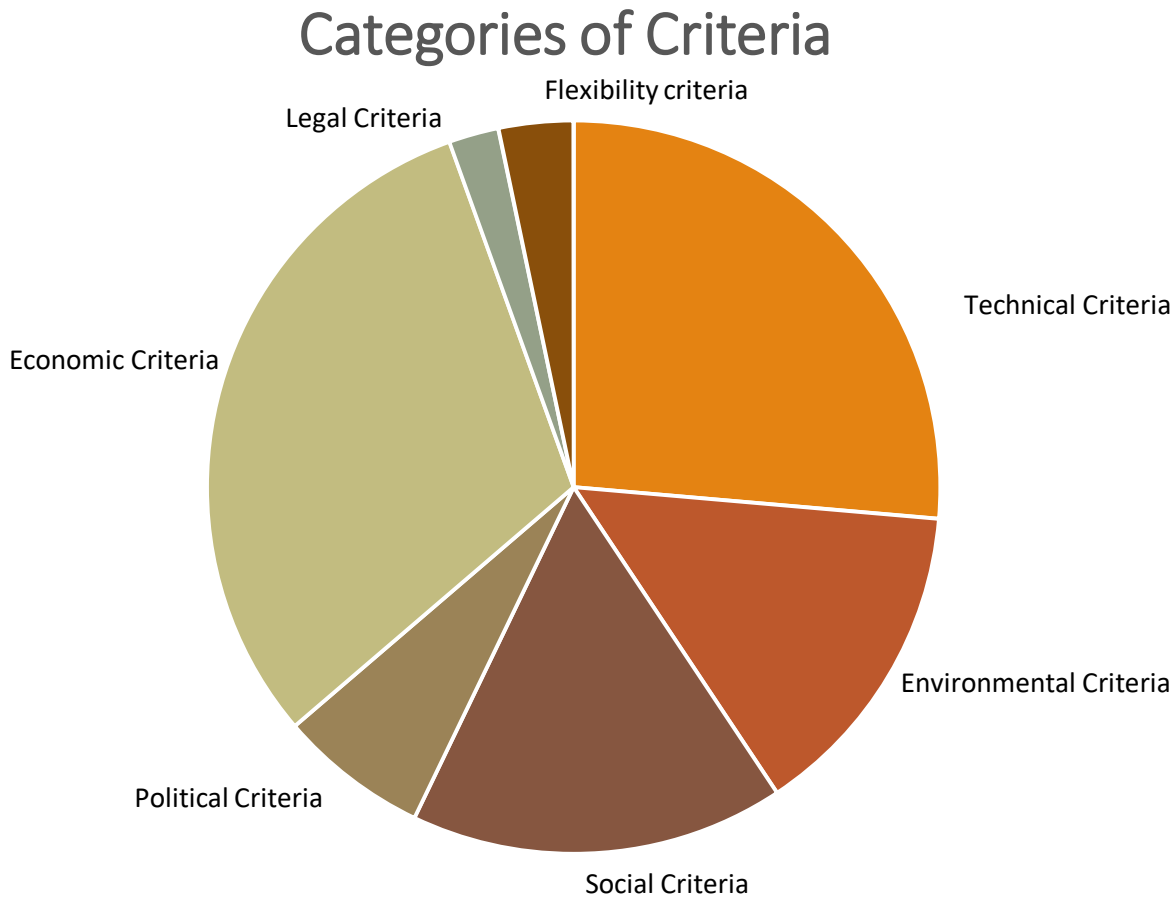
RESULTS

Methods in time



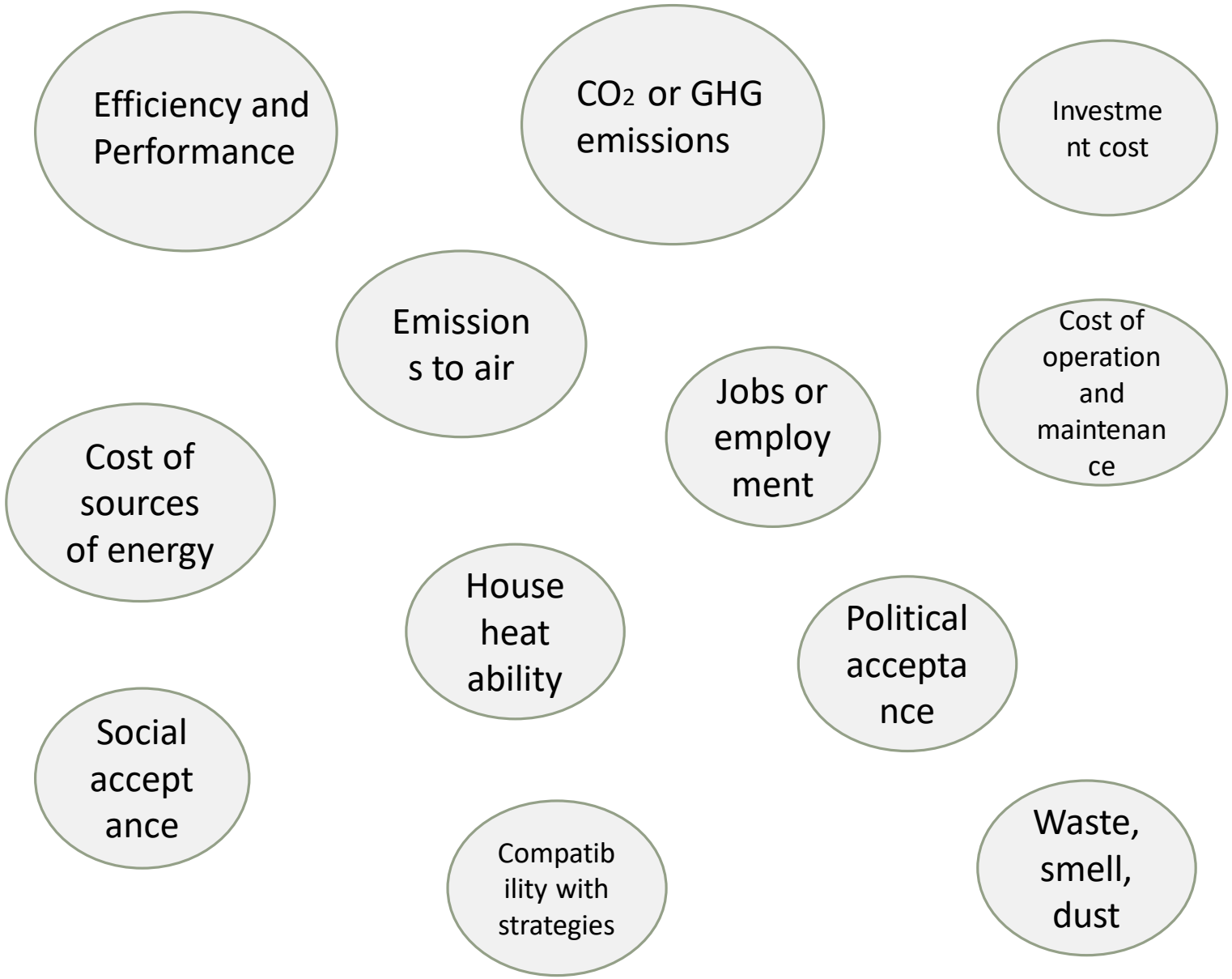
RESULTS

Multi-criteria Decision Making Methods



RESULTS

MCDM
Most used Criteria



RESULTS

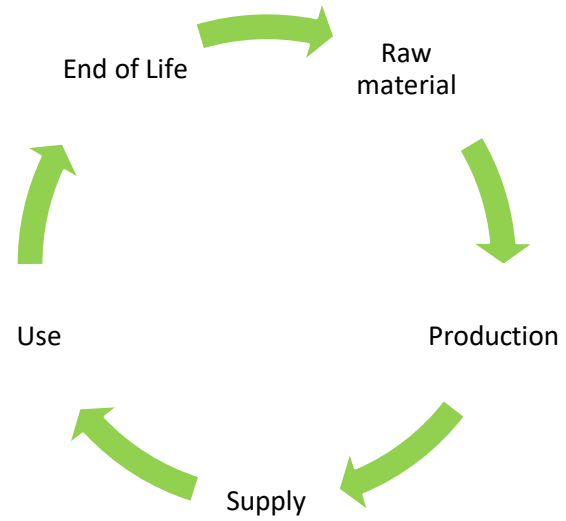
Sustainability Indicators

- ✓Three dimensions of sustainability
  - ✓Environment
  - ✓Economy
  - ✓Society
- ✓Use of a single or multiple indicators
- ✓Composite indicators
- ✓Indicators of international organizations e.g. OECD, WEC, WEF
- ✓Calculations for shorter or longer periods or comparison between different years

RESULTS

Life Cycle Methods

- ✓Impact categories cover the three dimensions of sustainability
  - ✓Environment
  - ✓Economy
  - ✓Society
- ✓Impact characterization factors
- ✓Life Cycle Indicators



RESULTS

Analyses Methods

- ✓Several analyses methods
- ✓General analysis or Specific methods
- ✓Most used :Scenario Analyses (4),
  - Data Envelopment Analysis (2)
  - Context Analyses (2)
  - Ex ante analysis (2)
  - SWOT analyses(2)
- ✓Quantitative and qualitative analysis

RESULTS

Other Methods

- ✓STO (strategic, tactical, and operational) context
- ✓Equity evaluation
- ✓Carbon dioxide emissions
- ✓Risk Assessment
- ✓Simulation, evaluation, and optimization
- ✓Combination of equilibrium models and hybrid life cycle-input–output analysis
- ✓Monte Carlo simulation

CONCLUSIONS

- ✓ Research since 1974 up to date
- ✓ Gap between 1986 – 1997
- ✓ Worldwide

- ✓ Wide range of approaches and methods
  - ✓ Assessment of already implemented strategies, policies or plans
  - ✓ Comparison between different periods or countries
  - ✓ Assessment for future scenarios

- ✓ Three dimensions of sustainability + technology and policy

CONCLUSIONS

- ✓ Proposal or testing of methods
- ✓ Policy formulation could be based on this assessment results and targets
- ✓ Limited combination of different approach methods
- ✓ Lack of research regarding
  - ✓ comparisons of methods
  - ✓ the effectiveness or accuracy of the methods

CONCLUSIONS

- ✓ Common findings:
  - ✓ Sustainable energy – renewable energy
  - ✓ Limitation of fossil fuel use
  - ✓ Diversity of sources

- ✓ Further research
  - ✓ Further methods, criteria, indicators
  - ✓ Combination of methods
  - ✓ Evaluation of methods
  - ✓ Comparison of methods

THANK YOU