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# How “digitalization” will change the energy and power industry in the next five years

A SCIENTOMETRICS TREND RESEARCH SHOW-CASE

**Nopgle**

Stop Searching. Start Knowing. Get Insights.

# I. Approach

SCIENTOMETRICS

# Noggle uses a digital approach, combining latest technologies in one solution

## *Scientometrics*

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... is the study of measuring and analyzing science, technology, and innovation. Major research issues include the measurement of tangible impacts, reference sets of articles to investigate the effect of journals and institutes, mapping scientific fields, and producing indicators for use in policy and management contexts.

## *Bibliometrics*

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... is statistical analysis of written publications, such as books or articles. Bibliometric methods are frequently used in the field of library and information science. For instance, bibliometrics is used to provide quantitative analysis of academic literature.

## *Text Clustering*

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... is defined as an automatic, nonsupervised grouping of similar documents into clearly labeled hierarchical clusters. Text clustering utilizes near real-time, fully automatic, nonsupervised machine learning in order to obtain a concise summary of the subjects discussed in a set of documents.



# Use-Case: Scientometrics Research Setting

## Search Topics

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- energy industry
- power industry
- Energy Ecosystem
- Electricity Network
- Digital Transformation  
Power Industry
- Smart Grid
- Smart Power
- Energy Grid
- Power Plant

## Search Space

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- Worldwide Patent Database (90m documents)
- IEEE (4.2m documents)
- TED Talks (3000 presentations)

# Used search space of 100 million documents



4.5m docs

The world's largest technical professional organization for the advancement of technology

"IEEE and its members inspire a global community to innovate for a better tomorrow through its more than 420,000 members in over 160 countries, and its highly cited publications, conferences, technology standards, and professional and educational activities. IEEE is the trusted "voice" for engineering, computing, and technology information around the globe."



90m docs

European Patent Office

"EPO contains data on more than 90 million patent documents from around the world."



0.3m docs

TED, a clearinghouse of free knowledge from the world's most inspired thinkers

"TED is a global community, welcoming people from every discipline and culture who seek a deeper understanding of the world. TED believes passionately in the power of ideas to change attitudes, lives and, ultimately, the world.— and a community of curious souls to engage with ideas and each other at TED events around the world."





## II. Scientometric Cluster Maps

SEARCHING IEEE, PATENTS AND TED TALKS ON GIVEN SUBJECTS, APPLYING  
TEXT CLUSTERING AND BUILDING VISUAL TREND MAPS



Source: Auto-generated, non-supervised cluster maps generated by the Noggle client application using a search space of ~100 million documents





Source: Auto-generated, non-supervised cluster maps generated by the Noggle client application using a search space of ~100 million documents



Search theme: Digital AND "Smart Energy"



Source: Auto-generated, non-supervised cluster maps generated by the Noggle client application using a search space of ~100 million documents

# III. Findings – ClusterMap Summary

KEY THEMES IMPACTING THE POWER INDUSTRY



# Key “digitalization” themes impacting the power industry

1. **Smart Buildings:** The new partners for intelligent energy networks and efficient energy supply.

The first important cluster detected is centered around Smart Buildings, with overlapping scientometric clusters like “Buildings,” “Smart Buildings,” “Smart Home Energy Management,” “Buildings and Cities,” and “Energy Harvesting.” Through the use of an automated technical

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2. **Electric Vehicles (EVs):** Will become the next normal. Energy on the move.

Scientometrics reveals clusters such as “Electric Vehicle,” “Vehicle Power,” “Induction Motors,” “Vehicle to Grid,” and “Internet of Things.” It looks like the 2020s will be the decade of the electric car. As EVs reach mass scale, plug-in cars challenge the local power grid, for example, overloads

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# Key “digitalization” themes impacting the power industry

## 3. Smart Markets: Replacing human traders with decentralized, automatic negotiation algorithms between devices.

The detected theme “Smart Markets” contains clusters like “Real-time Systems,” “Real-time control,” “Operation Schemes,” “Energy Nodes,” “Electricity/Energy Price,” “Dynamic Pricing,” “Control Schemes,” “Energy Allocation,” “Energy Trading Models,” “The Smart Market,”

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## 4. Neighborhood Area Network (NAN), the WLAN for Utilities: NAN is becoming mainstream for the utility last mile.

New protocol standards are coming into play, with clusters showing up around “ZigBee Networks,” “Transmission Network,” “Energy Appliances,” “Industrial Network,” “IEC 61850,” “Communication

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# Interconnection Cluster Pyramid



## Smart Buildings

*The new partners for intelligent energy networks and efficient energy supply.*





Want more?  
Interested in deep-cluster results?

Download your Noggle application to get started.  
Or get in contact with a Noggle Scientometrics Expert.

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