Extracting Value From Data

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June 18, 2016 Industrial Symbiosis Research Symposiu (ISRS)

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Identification → Evaluation → R&D → Piloting → Barrier Removal → Project Planning → Commercialization

New Value TAPs Identification

Improved Estimates of Regional Material Flows

Market Analysis

Simplified LCA

Partner ID

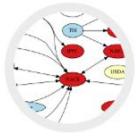
Simplified LCA

COLLECTING CASE STUDIES

We gather information on examples of Industrial Symbiosis and Eco-Industrial Parks in the wild.

MAKING WORK WITH CLASSIFICATION SYSTEMS EASIER

Tracking down the correct codes is hard. It doesnt have to be.



MAPPING AND INTEGRATING DATABASES

Which data sets can be linked, and what are the types of research that this will enable?

MATERIAL PROPERTIES

Be able to cross apply technologies that use one material to other similar (property) materials

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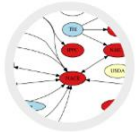

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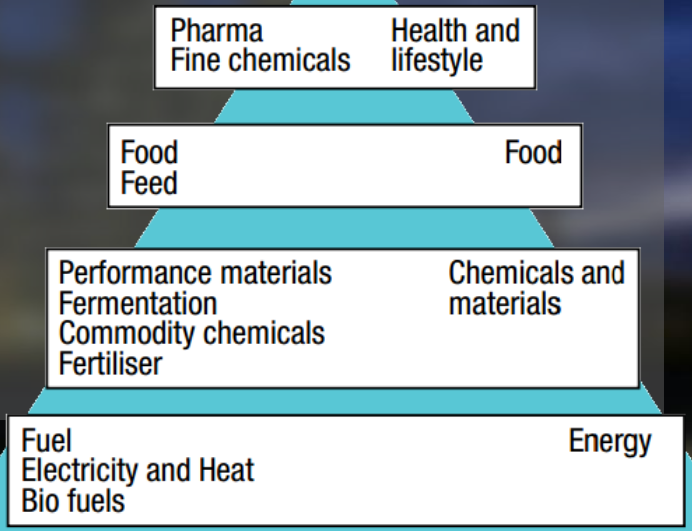
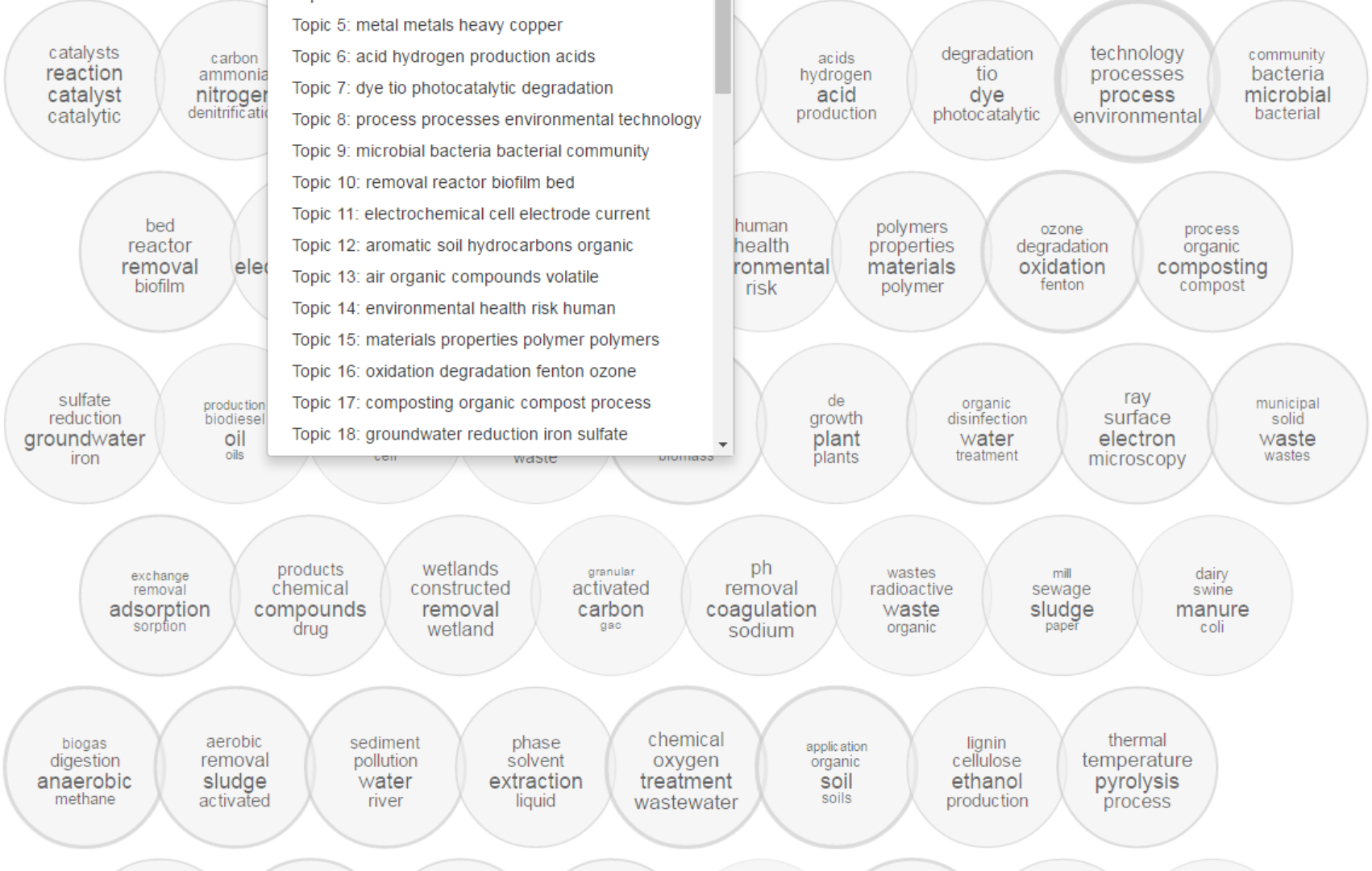
Technologies, Applications and Processes

- Topic modelling for general themes
- Co-occurrence matrices for mapping feedstocks and TAPs




Topic 5: metal metals heavy copper
Topic 6: acid hydrogen production acids
Topic 7: dye tio photocatalytic degradation
Topic 8: process processes environmental technology
Topic 9: microbial bacteria bacterial community
Topic 10: removal reactor biofilm bed
Topic 11: electrochemical cell electrode current
Topic 12: aromatic soil hydrocarbons organic
Topic 13: air organic compounds volatile
Topic 14: environmental health risk human
Topic 15: materials properties polymer polymers
Topic 16: oxidation degradation fenton ozone
Topic 17: composting organic compost process
Topic 18: groundwater reduction iron sulfate
catalysts reaction catalyst catalytic
acids hydrogen acid production
degradation tio dye photocatalytic
technology processes process environmental
community bacteria microbial bacterial
bed reactor removal biofilm
human health ronmental risk
polymers properties materials polymer
ozone degradation oxidation fenton
process organic composting compost
sulfate reduction groundwater iron
production biodiesel oil oils
de growth plant plants
organic disinfection water treatment
ray surface electron microscopy
municipal solid waste wastes
exchange removal adsorption sorption
products chemical compounds drug
wetlands constructed removal wetland
granular activated carbon gac
ph removal coagulation sodium
wastes radioactive waste organic
mill sewage sludge paper
dairy swine manure coli
biogas digestion anaerobic methane
aerobic removal sludge activated
sediment pollution water river
phase solvent extraction liquid
chemical oxygen treatment wastewater
application organic soil soils
lignin cellulose ethanol production
thermal temperature pyrolysis process

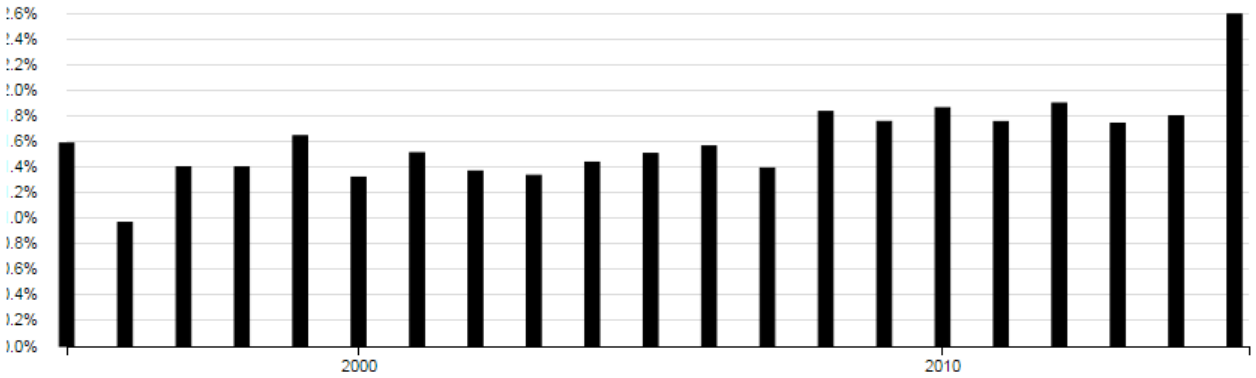
Top words

Word	Weight
acid	
hydrogen	
production	
acids	
fermentation	
fatty	
acetic	
ph	
glucose	
lactic	
acetate	
waste	
volatile	
yield	
substrate	
carbon	
organic	
culture	
pha	
food	
biohydrogen	

Yearly proportion of words in topic

Click a bar to limit documents to that year

clear selected year



Top documents

Document	%	Tokens
B.S., Yun J.H. Sawant S.S. Kim. “Production of polyhydroxyalkanoates by Ralstonia eutropha from volatile fatty acids.” *Korean Journal Of Chemical Engineering* 30, no. 12 (2013): 2223 2227.	88.8%	111
Kartik, Vajpeyi Shashwat M.; Chandran. “Conversion of organic-waste derived volatile fatty acids into biodiesel through enhanced microbial lipid production: A novel platform technology.” *Abstracts Of Papers Of The American Chemical Society* 248, no. NA (2014): .	85.7%	12
S.J., Ngo T.A. Kim M.-S. Sim. “High-yield biohydrogen production from biodiesel manufacturing waste by Thermotoga neapolitana.” *International Journal Of Hydrogen Energy* 36, no. 10 (2011): 5836 5842.	81.8%	139

B.S., Yun J.H. Sawant S.S. Kim. “Production of polyhydroxyalkanoates by Ralstonia eutropha from volatile fatty acids.” *Korean Journal Of Chemical Engineering* 30, no. 12 (2013): 2223 2227.

125 tokens. (view online)

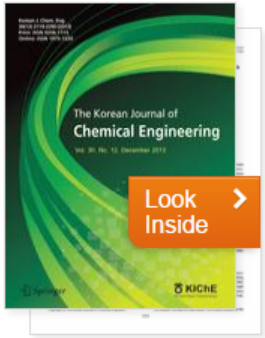
Topic	Top words	%	Tokens
Topic 6	acid hydrogen production acids fermentation fatty acetic ph glucose lactic acetate waste volatile yield substrate	88.8%	111
Topic 3	concentration results temperature effect conditions rate mg time higher ph showed concentrations increased effects low	7.2%	9
Topic 8	process processes environmental technology industrial products chemical industry research based paper high methods cost review	1.6%	2
Topic 37	water pollution river sediment sediments concentrations quality organic urban environmental area monitoring surface concentration source	1.6%	2
Topic 4	water treatment wastewater waste organic effluent plant plants management sewage effluents quality article disposal biological	0.8%	1

Biotechnology
Korean Journal of Chemical Engineering
December 2013, Volume 30, Issue 12, pp 2223-2227

First online: 14 November 2013

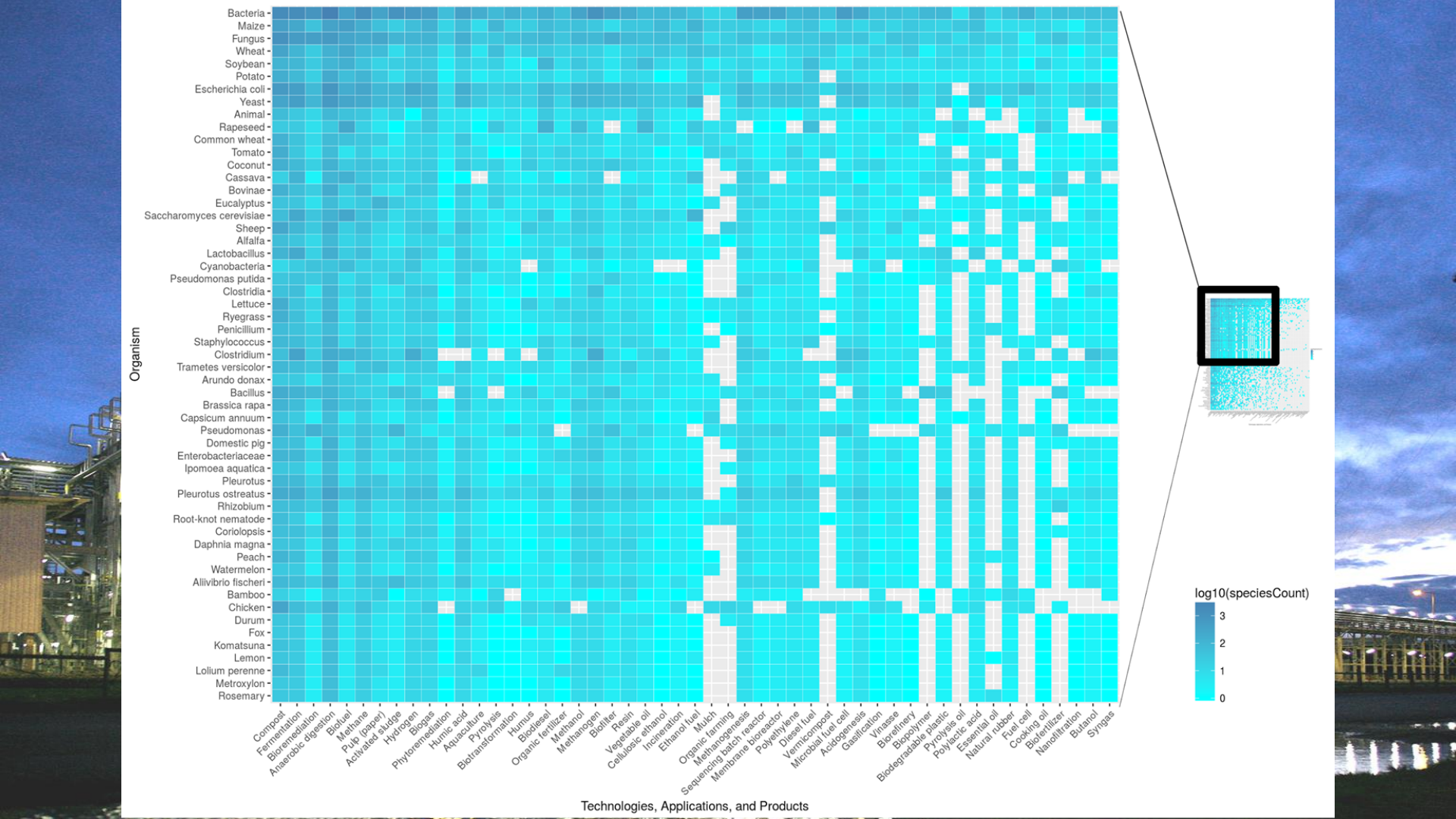
Production of polyhydroxyalkanoates by *Ralstonia eutropha* from volatile fatty acids

Jung Hyun Yun, Shailesh S. Sawant, Beom Soo Kim



Abstract

Polyhydroxyalkanoates (PHAs) are biodegradable and biocompatible thermoplastics that can be synthesized in various microorganisms. Volatile fatty acids (VFAs) are produced by anaerobic treatment of organic wastes that can be utilized as inexpensive substrates for PHA synthesis. In this study, several *Ralstonia eutropha* strains were grown on the mixture of VFAs (acetic, propionic, and butyric acid) as its carbon and energy source for growth and PHA synthesis. *R. eutropha* KCTC 2658 accumulated PHAs up to 50% of dry cell weight from total 5 g/L of mixed VFAs (acetic acid: propionic acid: butyric acid=1: 2: 2). In batch culture of *R. eutropha* KCTC2658 in a 5 L fermentor, a homopolymer of poly(3-hydroxybutyrate) [P(3HB)] was produced from 20 g/L glucose as a sole carbon source with dry cell weight of 8.4 g/L and PHA content of 30%. In fed-batch culture, two feeding strategies, pulse or pH-stat, were applied to add VFAs to the fermentor. When VFAs were


Organism
Bacteria
Maize
Fungus
Wheat
Soybean
Potato
Escherichia coli
Yeast
Animal
Rapeseed
Common wheat
Tomato
Coconut
Cassava
Bovinae
Eucalyptus
Saccharomyces cerevisiae
Sheep
Alfalfa
Lactobacillus
Cyanobacteria
Pseudomonas putida
Clostridia
Lettuce
Ryegrass
Penicillium
Staphylococcus
Clostridium
Trametes versicolor
Arundo donax
Bacillus
Brassica rapa
Capsicum annuum
Pseudomonas
Domestic pig
Enterobacteriaceae
Ipomoea aquatica
Pleurotus
Pleurotus ostreatus
Rhizobium
Root-knot nematode
Coriolopsis
Daphnia magna
Peach
Watermelon
Aliivibrio fischeri
Bamboo
Chicken
Durum
Fox
Komatsuna
Lemon
Lolium perenne
Metroxylon
Rosemary
Compost
Fermentation
Bioremediation
Anaerobic digestion
Bioluel
Methane
Pulp (paper)
Activated sludge
Hydrogen
Biogas
Phytoremediation
Humic acid
Aquaculture
Pyrolysis
Biotransformation
Humus
Biodiesel
Organic fertilizer
Methanol
Methanogen
Biofilter
Resin
Vegetable oil
Cellulosic ethanol
Incineration
Ethanol fuel
Mulch
Organic farming
Methanogenesis
Sequencing batch reactor
Membrane bioreactor
Polyethylene
Diesel fuel
Vermicompost
Microbial fuel cell
Acidogenesis
Gasification
Vinasse
Biorefinery
Biopolymer
Biodegradable plastic
Pyrolysis oil
Polylactic acid
Essential oil
Natural rubber
Fuel cell
Cooking oil
Biofertilizer
Nanofiltration
Butanol
Syngas
Technologies, Applications, and Products
log10(speciesCount)
3
2
1
0

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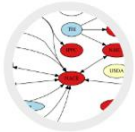

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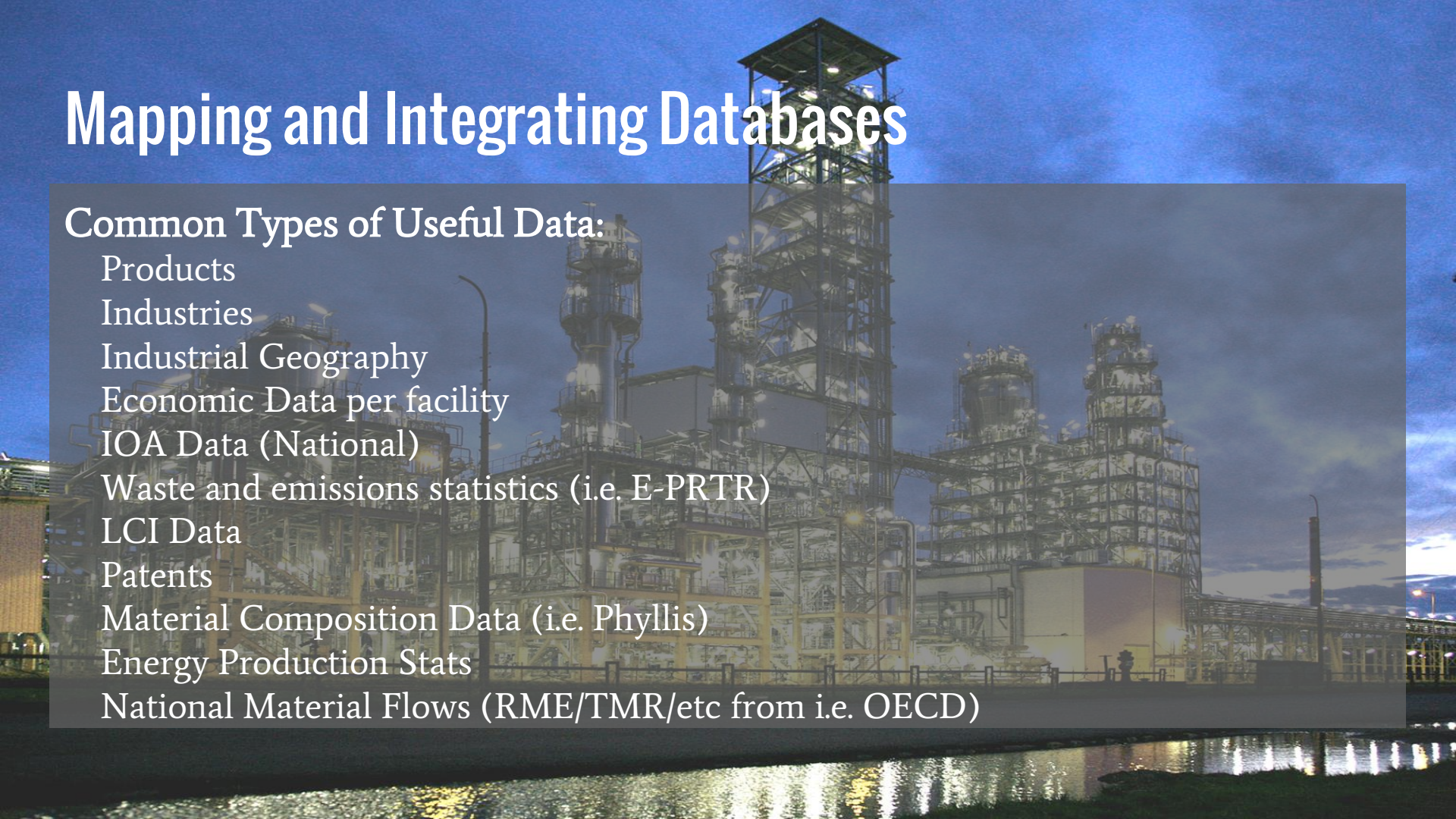

Common Types of Useful Data:

- Products
- Industries
- Industrial Geography
- Economic Data per facility
- IOA Data (National)
- Waste and emissions statistics (i.e. E-PRTR)
- LCI Data
- Patents
- Material Composition Data (i.e. Phyllis)
- Energy Production Stats
- National Material Flows (RME/TMR/etc from i.e. OECD)

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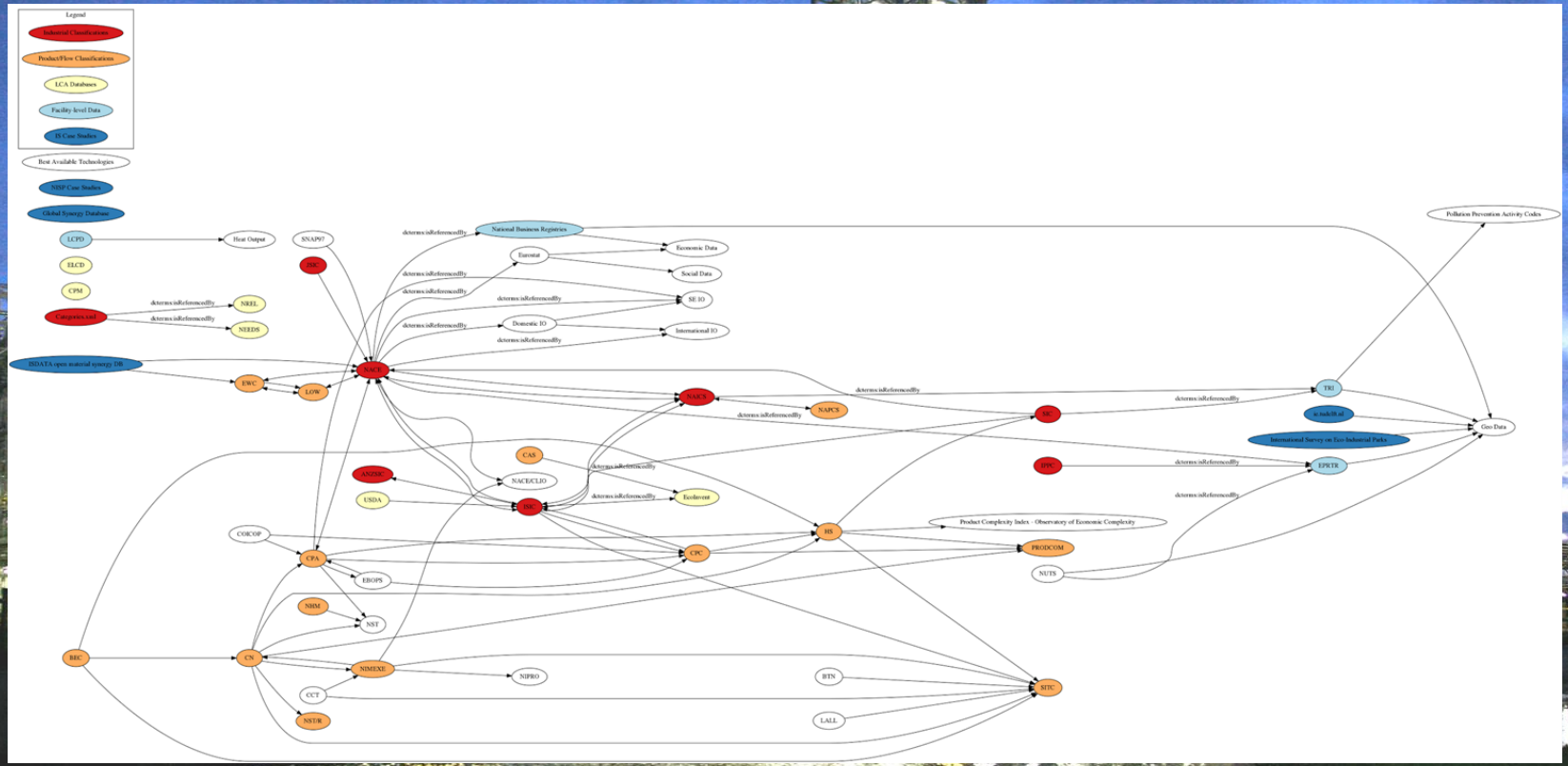

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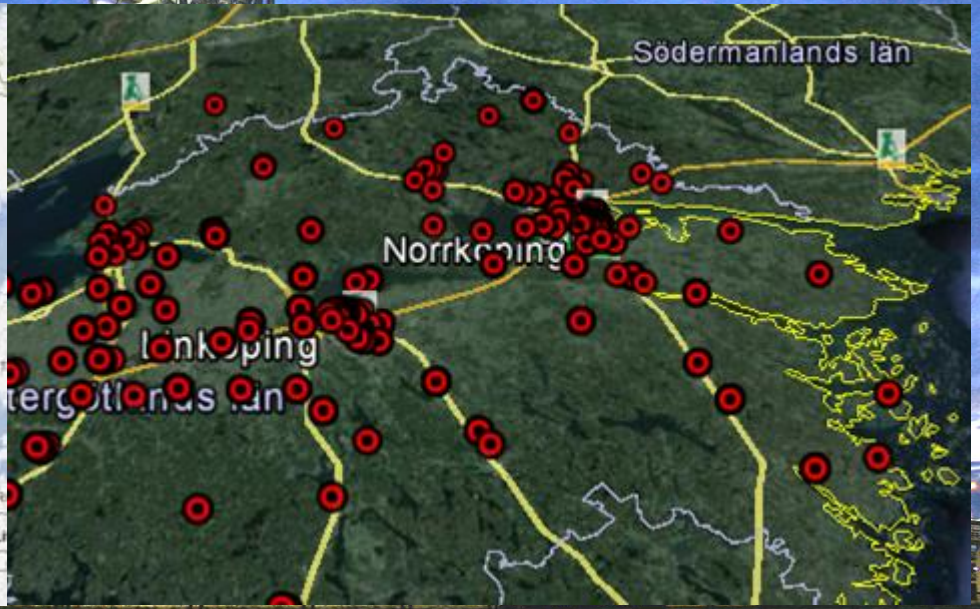


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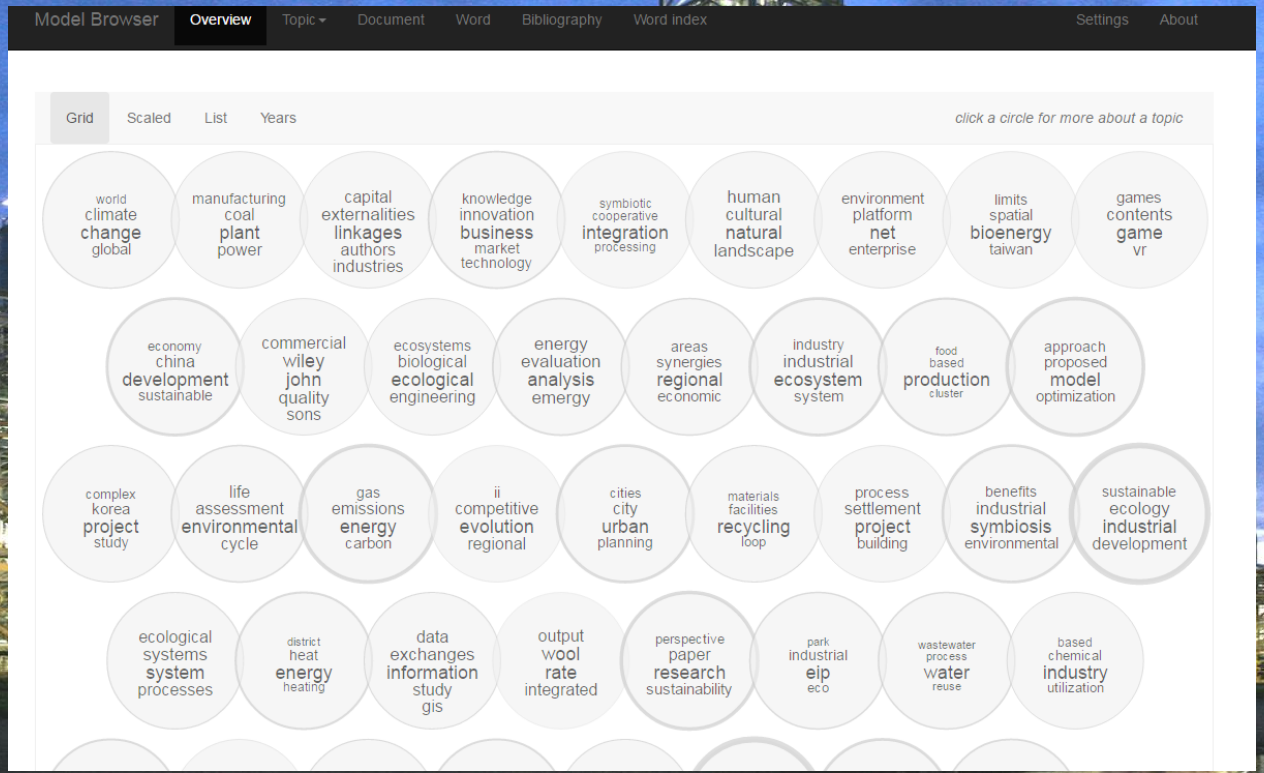
Topic Analysis of IS Studies



Reflections

This is not one monolithic project - set of components

Part of larger strategies

How does this fit into yours and other's workflow?


ISData.org
github.com/isdata-org/
Thanks!