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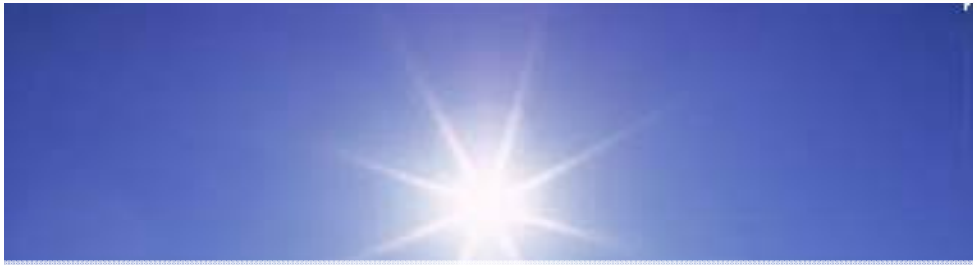

Business Interactions in emerging industries - The case of the Solar Energy Industry in California

Local and global networks

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Outline

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Just a concentration of companies or a cluster?

- Greater San Francisco Bay Area

  Concentration of solar energy companies, due to already existing suppliers for the demand of wafer production, structural changes in the microelectronic industry

- around 20 cell manufacturers and many start-up companies are located here

COE was able to identify approximately 770 solar businesses statewide

- 33% in Bay Area
- 16% in Greater Sacramento
- 26% in Southern California*
- 14% in Los Angeles*
- 11% balance of state

*Southern California data includes: San Diego, Imperial, Orange, Riverside, San Bernardino, Ventura and Los Angeles counties. Los Angeles figure represents percent of county to statewide data.

California Solar Employment

- California – approximately 17,000 jobs*

Regional distribution of employment

- Bay Region – 8,000 jobs
- Greater Sacramento – 800 jobs
- Los Angeles – 2,000 jobs
- Southern California – 4,900 jobs

Situation in Gainsville:

Hypotheses regarding Interactions:

1. In the Solar energy industry local interactions are more important than interregional linkages.
2. The extent of spatial proximity of companies depends on the level in the value chain.
3. Cell manufacturers are located nearby already existing locations of the microelectronic industry, due to similar basic raw material (silicon) for the production, venture capital or specialized labour
4. Global players fulfil the role as a toehold and exchange new technologies between networks in different production sites.

Hypotheses regarding Incentives

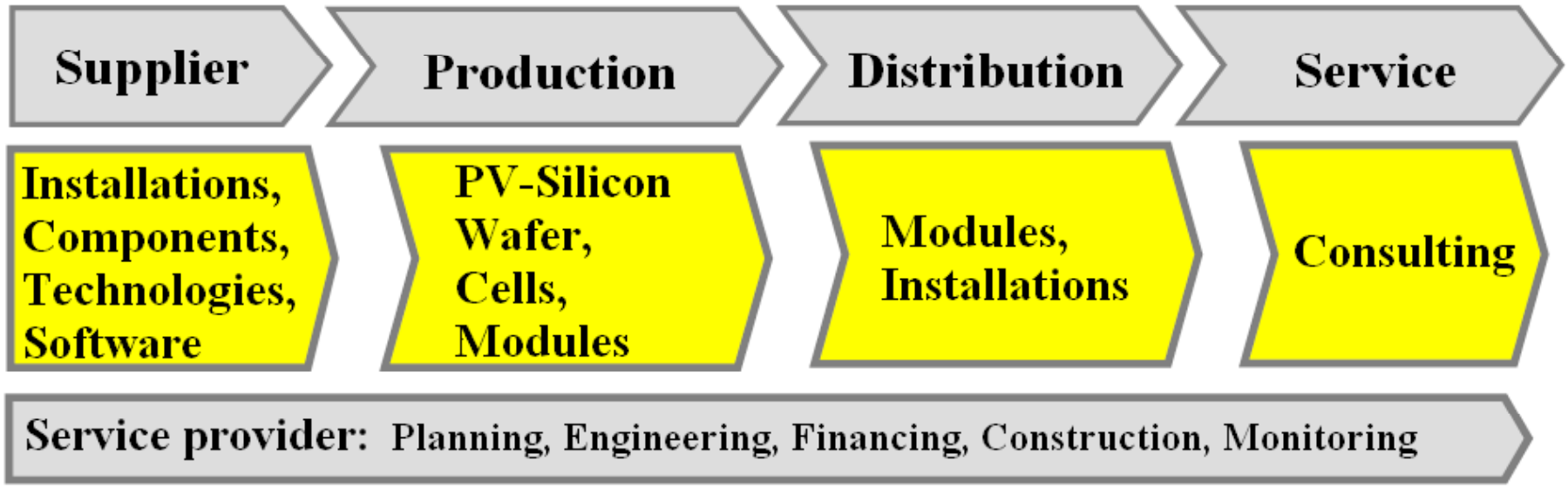
1. Incentives not only stimulate the demand of products, they also foster the formation of industry associations and thus the development of networks
2. There is a high degree of cooperation between different solar energy industry associations in California.
3. Business networks are crucial for market entry and the representation toward the state.

Modified research questions:

Main question: How do the business networks in the solar energy industry look like?

- Are they locally or globally oriented, are they formal or informal?
- Do they have a sufficient quality and quantity?
- Which factors are essential for the formation of networks and for their persistence?
- Which role play institutions and norms for the stimulation of networks?

Concept of the value chain

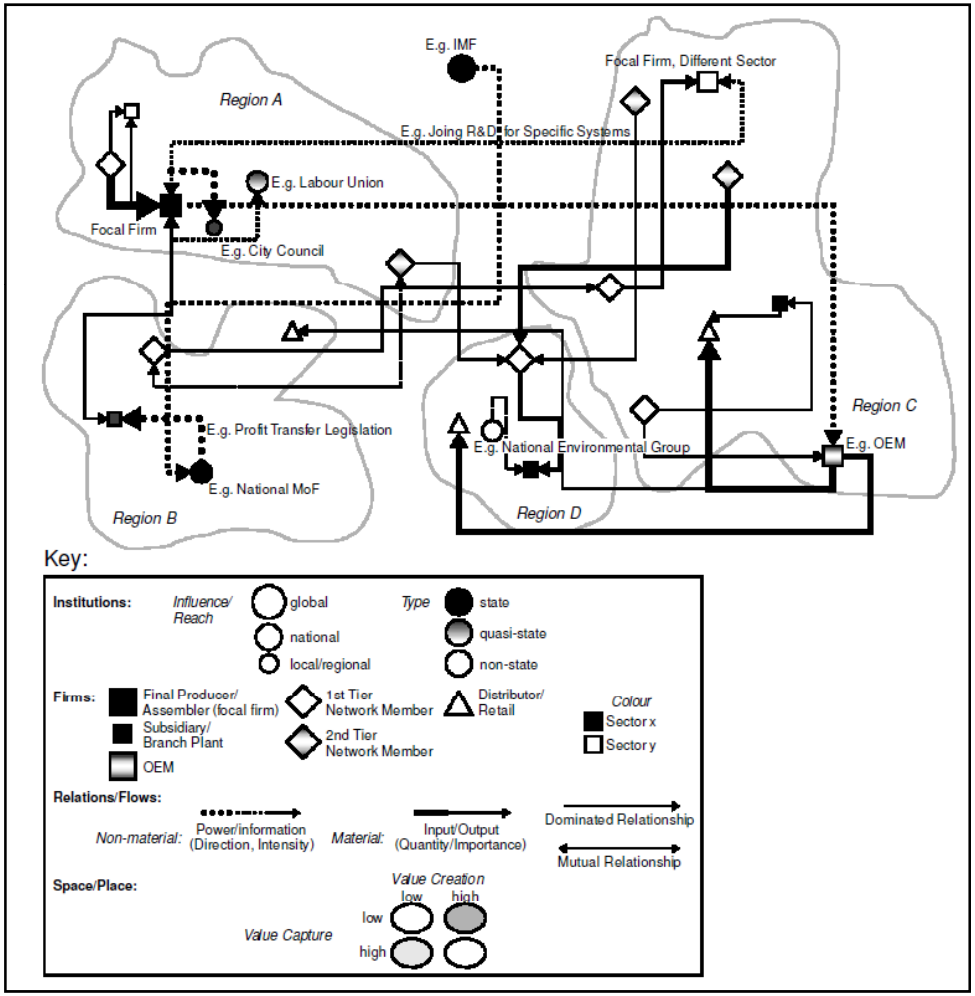


- several different, competing technologies in this market (polycrystalline vs. thin-film technology)
- Distribution is split in two different channels: Commercial electricity production and homeowner use

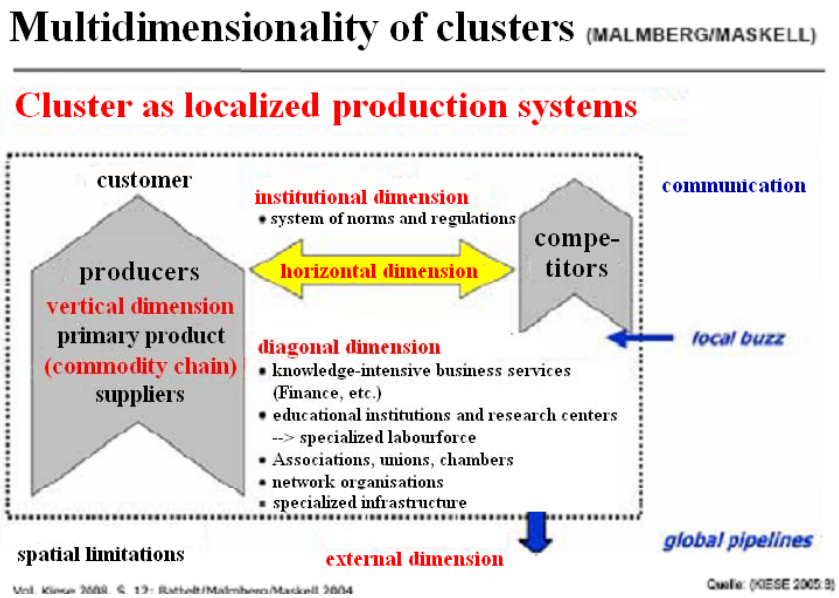
From value chains to global production networks

- Includes various actors, inter-firm networks, institutions
- Regions fulfill specific functions within a global production network
- Not limited to material flows but also immaterial, information flows
- Focuses on non-linear interactions in the value chain

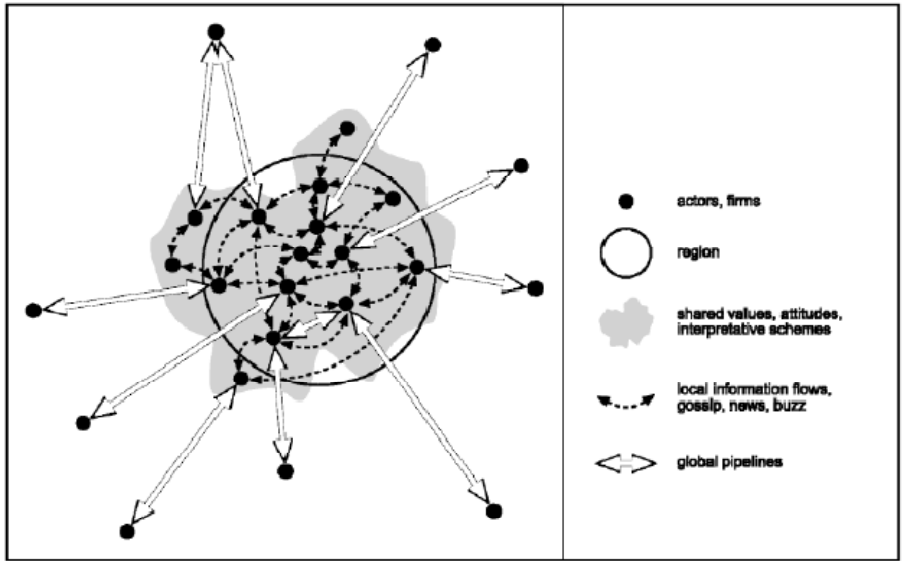
  → Network instead of chain



Local buzz and global pipelines



"Local buzz is beneficial to innovation processes because it generates opportunities for a variety of spontaneous and unanticipated situations where firms interact and form interpretative communities"

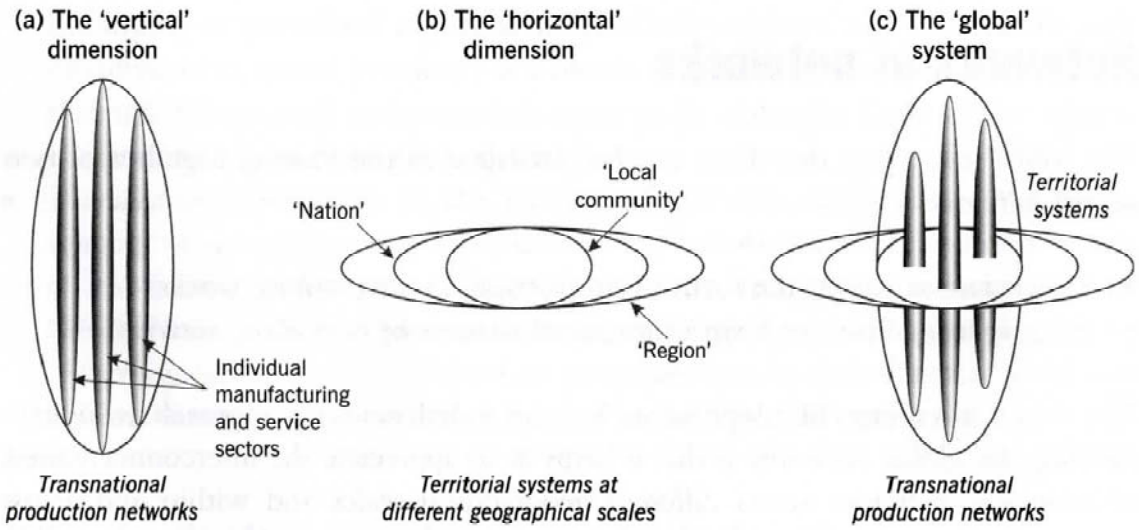


Bathelt/Malmberg/Maskell 2004, S. 46 (auch Bathelt 2004, S. 101)

"The advantages of global pipelines are instead associated with the integration of multiple selection environments that open different potentialities and feed local interpretation and usage of knowledge [...]" (Bathelt, Malmberg & Mankell 2004)

Networks of networks

- Local and global networks



- Which dimension is important for solar companies?

Research design:

Statistical information

- publications by different solar energy organizations

Initiation of interviews and ethnographic research

- Trade fair: Solar Power International in Anaheim, California from October 27-29th, 2009
- Largest industry trade show in the USA with more than 24,000 industry professionals

Interviews

- 12 qualitative expert interviews
  - 6 face-to-face interviews
  - 6 telephone interviews
- companies along the supply chain
  - Wafer manufacturer
  - Module manufacturer
  - Cell manufacturer
  - Installation companies

  global players, start-ups, vertically integrated companies
- 2 organizations, 1 consulting company, 1 venture capital company

Results (Selection)–

What is the reason being located here?

”[…] the Silicon Valley is a hub […] we have […] quite a few universities with Stanford, Berkley, San Jose, Santa Clara, San Jose State for example. There are a lot of connections here in Silicon Valley […]” (consulting company)

“[…] cumulative the entire team has an experience of 300 years in Silicon Valley - that is huge!”

“One of the gentlemen who was a founder has been living here for quite a while and working out of this area. I think it is the business climate here […]”

Connections to local or global actors?

“[…] we have a production facility in India and we are always in contact with them […] we do a lot of video conferencing or phone calls and so on (vertically integrated company)”

“[…] local knowledge is more important, but just at this particularly point. As our company will grow I think this will change.” (start-up)

Results (Selection)–

Cooperation with other companies

“How do you get new business contacts?“ “We don‘t have to do anything. They‘ll come to us […]“ (Interview with one global player)

„The competition in the market is very strong, but we work together with our competitors regarding formal standards for solar modules“

How do you get new knowledge and information?

“We generate knowledge about new technologies in our company”

“The most important source of Information about new developments in the market derives from industry magazines or the internet”

Findings (Selection)

- Interactions between suppliers and customers are not necessarily dependent on spatial proximity
- Extent of interactions indeed vary depending on the position of the companies in the supply chain
- Interactions with lateral actors (e.g. venture capital companies) are very depending on spatial proximity

  → material flows vs. information flows

- Generally limited amount of interactions
- Mode of interaction is depending on the company

Findings (Selection)

- Knowledge is mostly created within the companies their self
- Companies limit their knowledge to certain other companies
  → Gatekeepers in the innovation process
- Codified knowledge sources seem to be more important than local 'buzz'

- Concentration only on some activities in the future

- Institutions are important for specific proposes
- Larger companies have more interest to engage with institutional actors

→ Region fulfills the role of a **hub** for **specific functions within the global production system**

Thank you very much

for your attention!!!

Challenges:

- information are confidential
- Current crisis in the solar energy industry due to changes in initiatives and the financial crisis
- organizational issues (two trips to the Bay Area)
- headquarters are located outside the Bay Area (e.g. China)
  → Referrals to authorities in other regions
- organizations were not willing to facilitate contacts to solar companies