

From Green to Clean:

Industry emergence and the institutional framing of Cleantech in North America

Research Questions

This paper examines the social processes and mechanisms behind the creation and rapid growth of "cleantech" as an emerging industry.

Research was guided by the following questions:

1. Why did cleantech succeed in gaining legitimacy in the US venture community and beyond?
2. How was cleantech framed, and how did those frames change over time?

Theoretical approach

- Drew upon on theories of industry emergence, institutional entrepreneurship & institutional logics to explain how industries arise from a complex network of material and symbolic relationships and transactions (Rosa & Porac 2002; Van den Ven & Garud 1989).

- Focused on institutional entrepreneurship at the field level in the creation of new industries - in particular the use of labels, categories, cultural accounts and frames which are important in establishing legitimacy and diffusion of new technologies and industrial clusters.

- Identified the institutional logics of cleantech by studying "frames" which help give coherence to a diverse array of symbols and ideas (Gamson & Lasch, 1983) and which structure and support an argument.

Methods & data

Research approach taken was "field analytic" (Scott et. al 2000; Lounsbury et al, 2002). A blend of real-time and retrospective data was gathered.

Data Sources

Observations at 8 key conferences on VC and cleantech (2004-07)

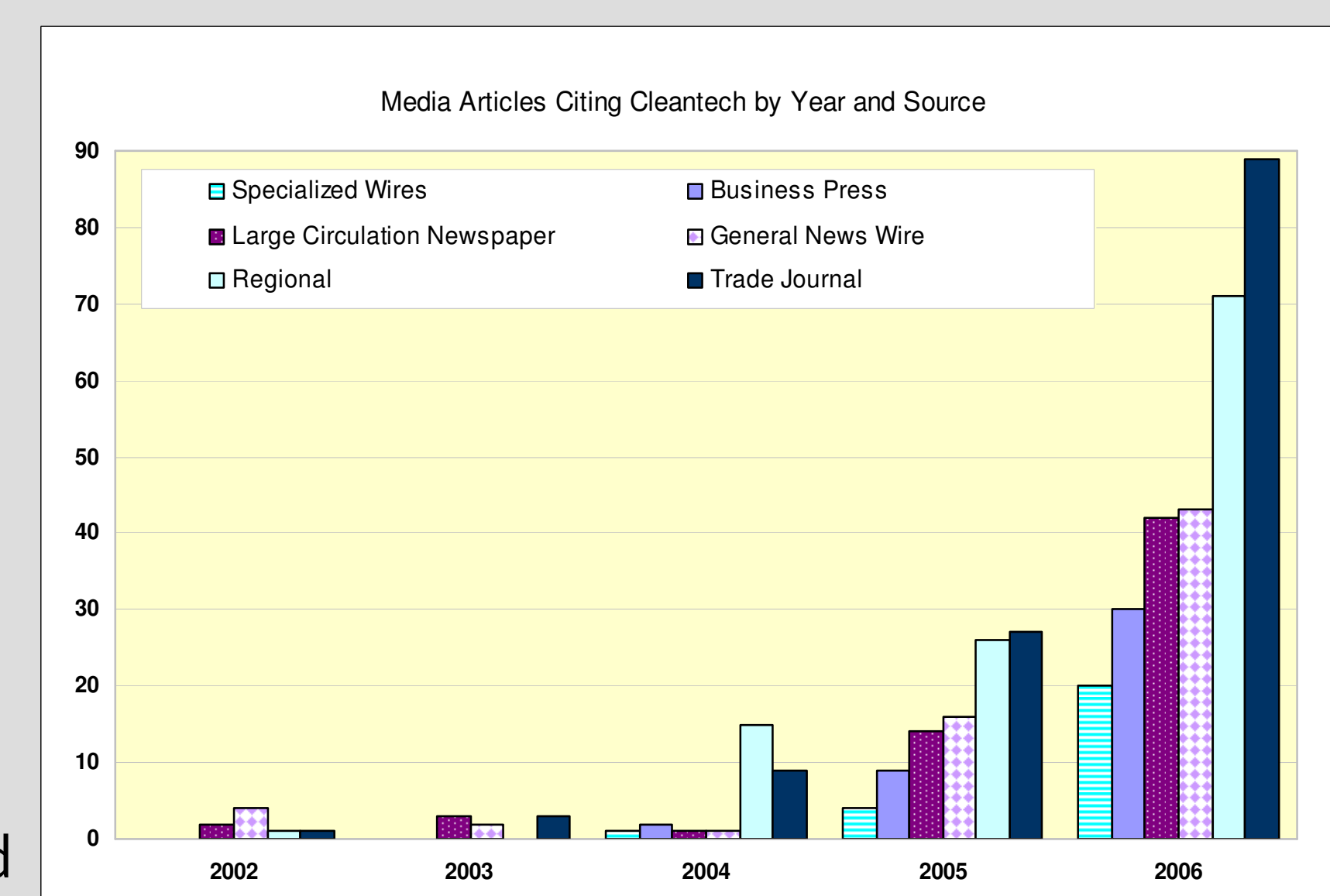
Interviews with 42 actors active in constructing cleantech as a category (2004-08)

Archival Research:

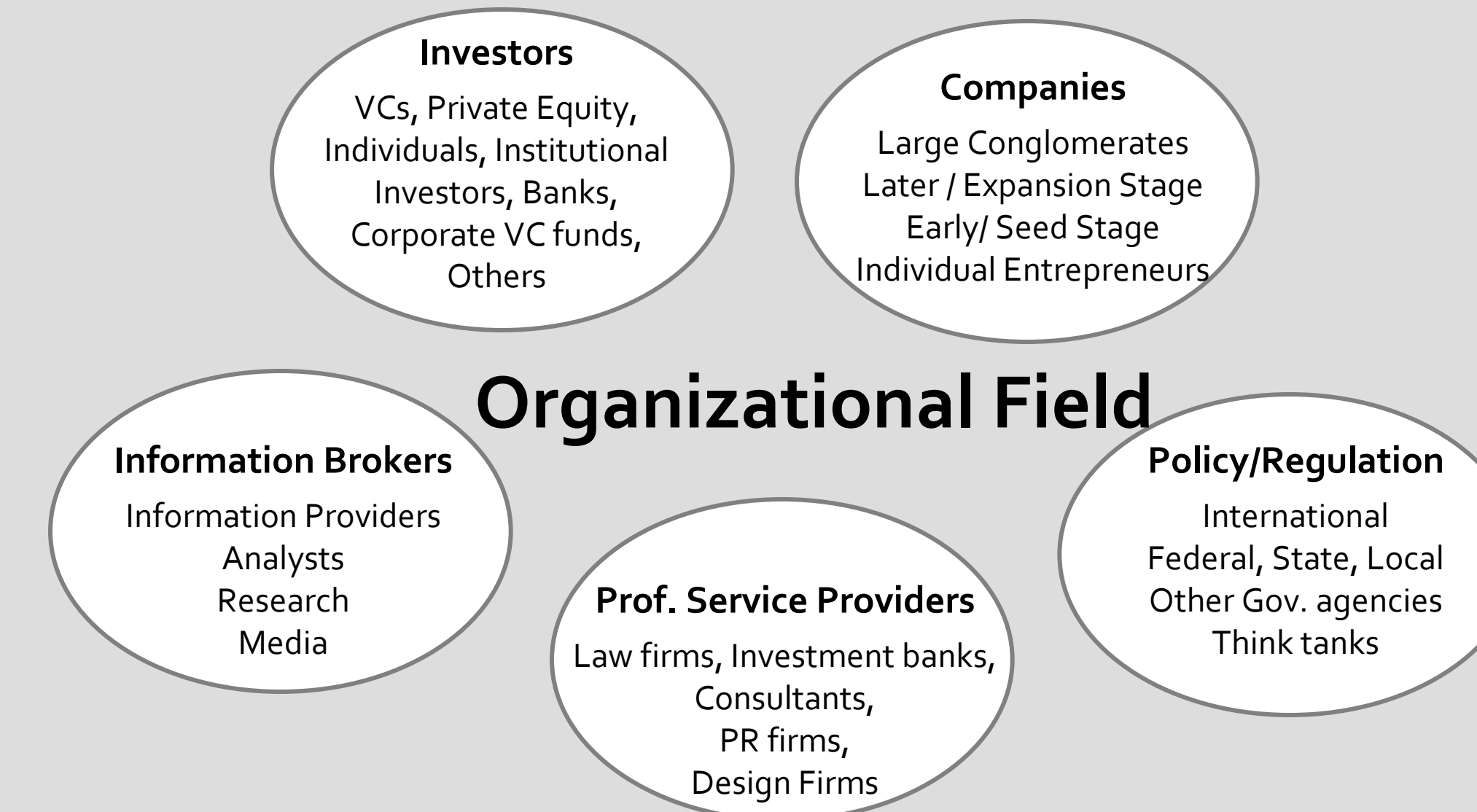
- Reports and presentations on cleantech by industry participants (2002-08)
- Comprehensive analysis of media articles North America (2002-06)

Steps

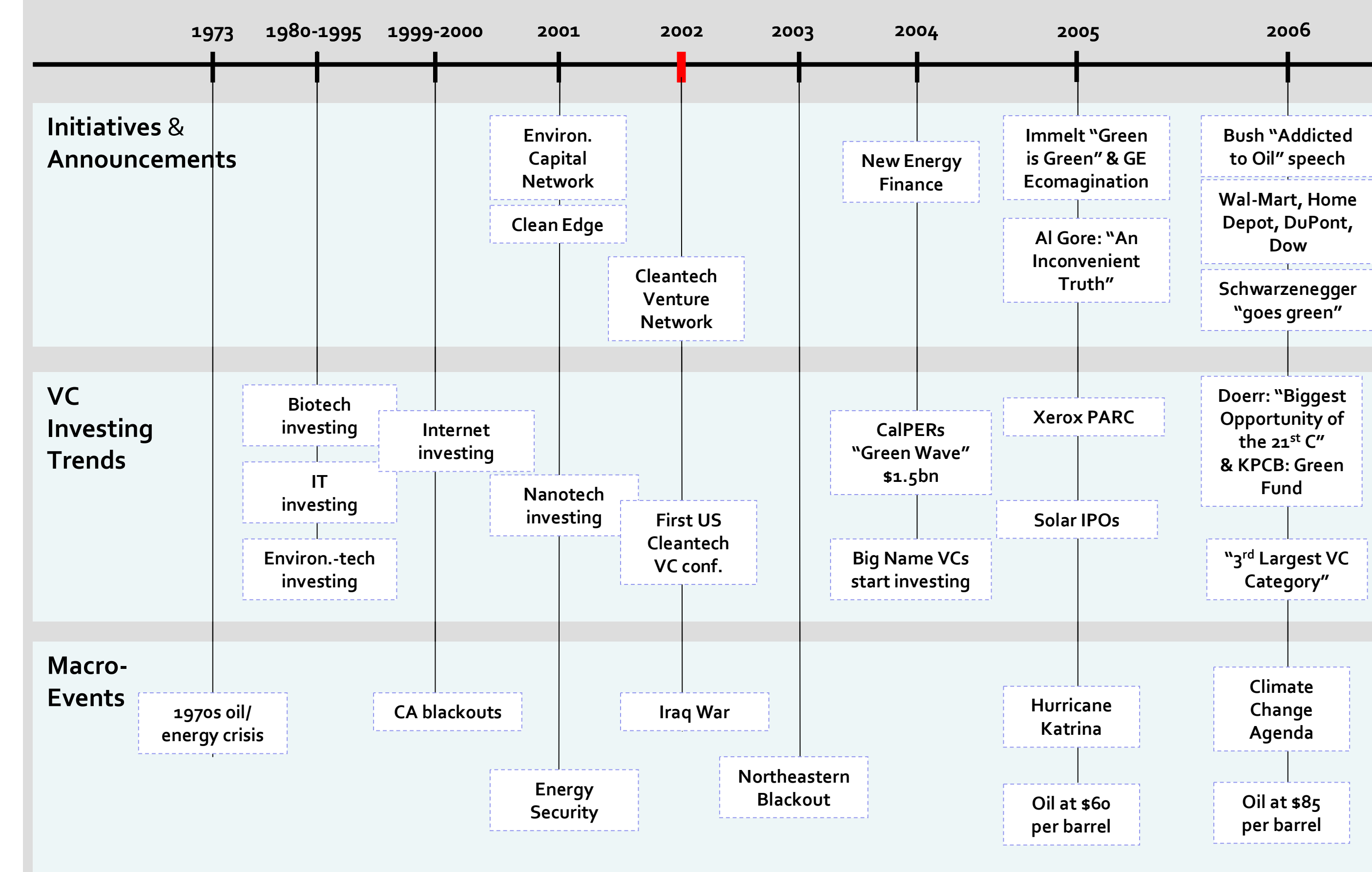
- Map and gather data on the organizational field
- Content Analysis to identify and articulate key frames or institutional logics in different phases.
- Test and re-formulate frames by retroductively analyzing the various texts and sources of data.
- Analyze how print media picked up and re-interpreted frames.



Findings



Key events



Three distinct phases

Phase	Description
1995-2000	- Clean technologies and entrepreneurs were either categorized as environmental technology or fit into another category. - Cleantech investments were relatively obscure and overshadowed by the dot.com and IT investing boom.
2002-2004	- Institutional entrepreneurs distance cleantech from environmental-tech - Broad definition, closely linking cleantech to other legitimate technology & organizational fields - VC's as spokesmen
2005-2008	- Cleantech attracted investors and a wider audience - Cleantech linked to salient macro-issues and current events such as energy security, climate change, oil prices and job creation.

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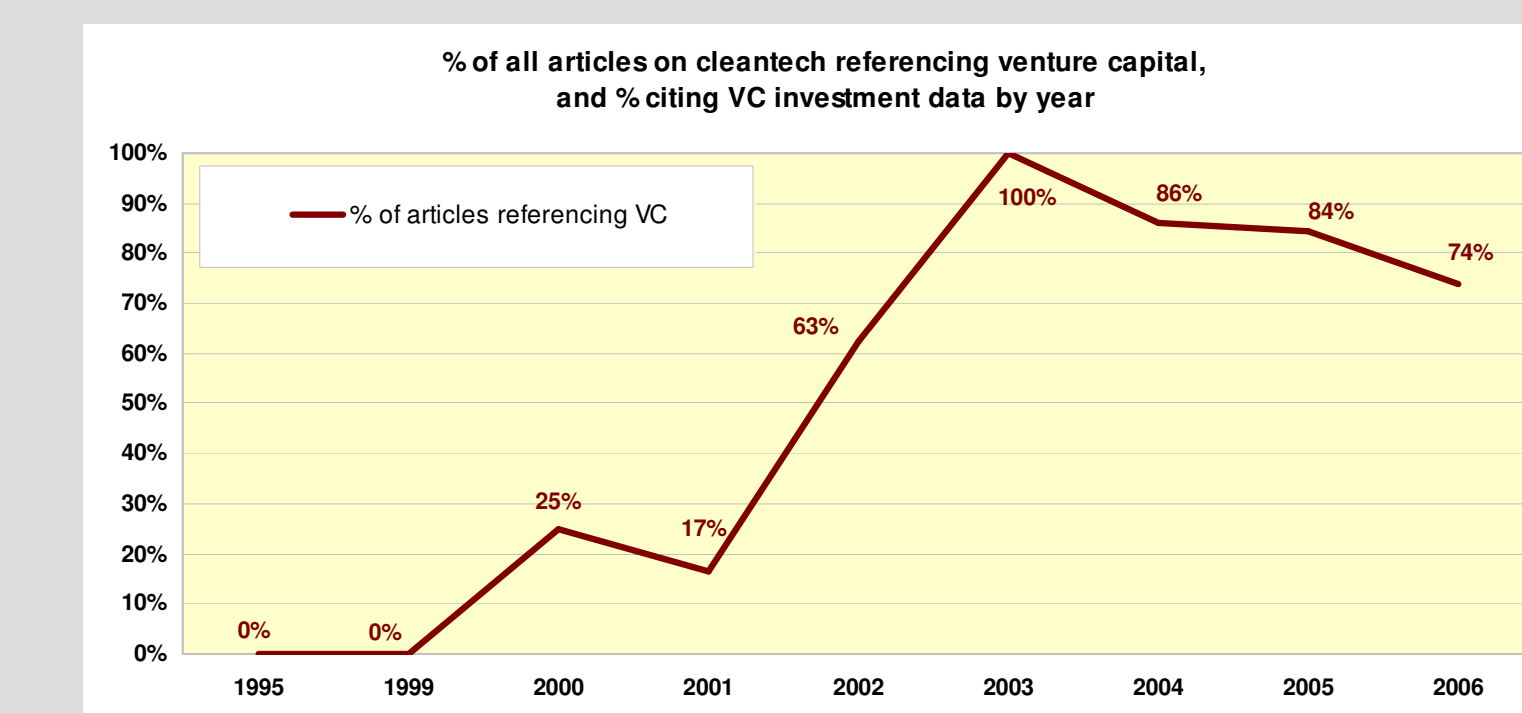
Five frames

1. Definition of cleantech purposely broad

- Inclusive, therefore large group
- Defined by example
- Applied to other existing technologies re-categorization

2. Cleantech a Venture Capital Category

- Recruited as credible spokespeople
- VC category positioned as similar to biotech, info-tech etc

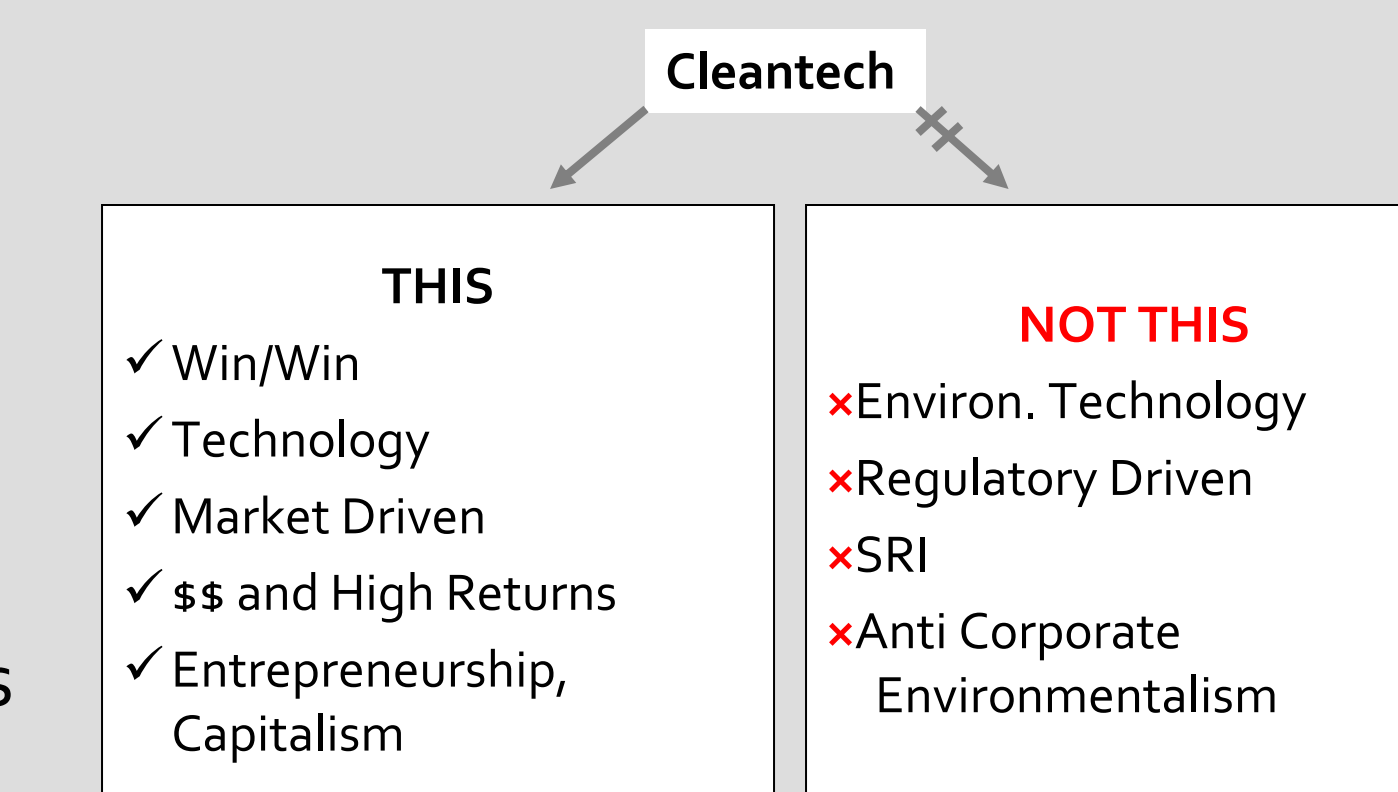


3. Cleantech ≠ Environment

- Intentional separation from enviro-tech & green movement
- Later when global warming & green are popular, a re-connection is made

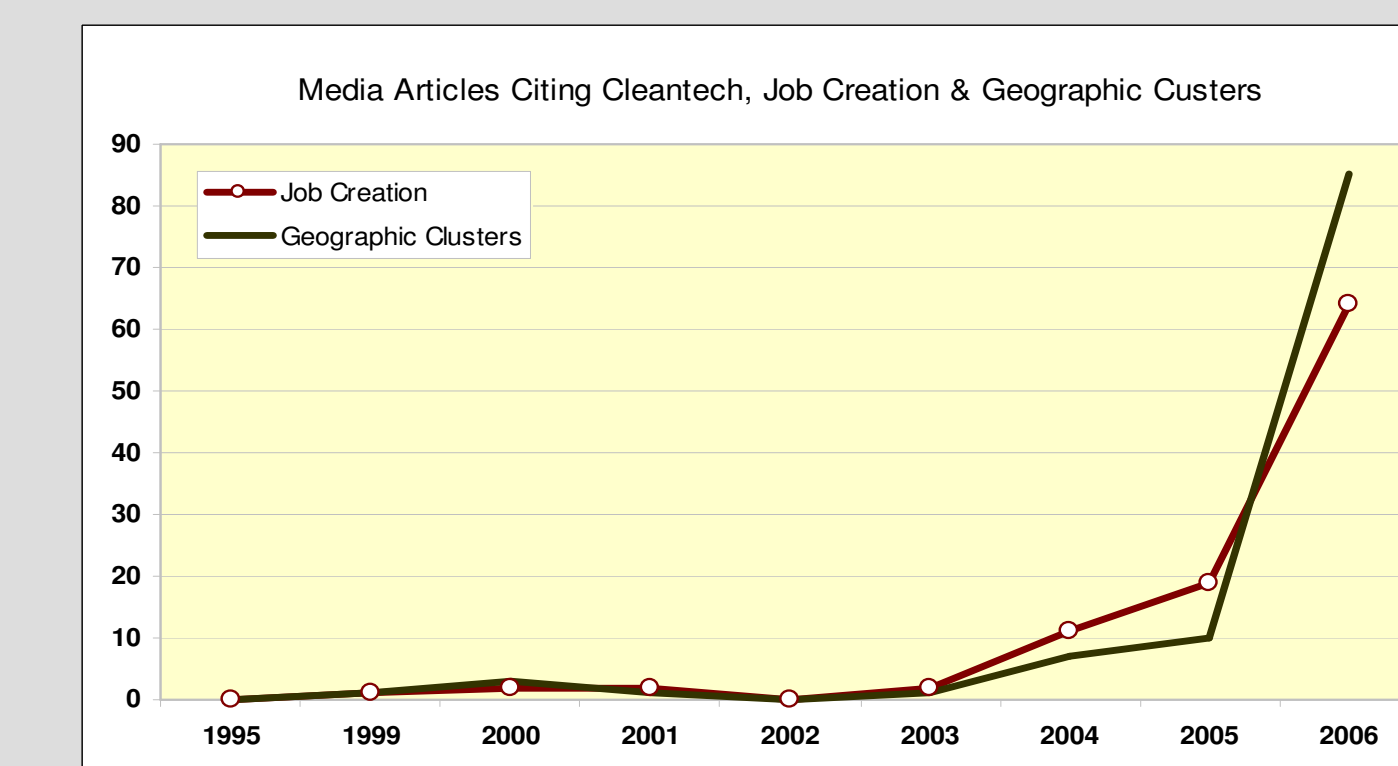
4. Cleantech is unique, with diverse drivers and risks

- Risks faced 'different' to other sectors
- Diversity of drivers reduces risk



5. Cleantech = Job Creation

- Connect to economic issues
- Regional development
- Cleantech clusters
- Government interest



Conclusions

- Cleantech was the result of intentional actions of a small group of institutional entrepreneurs: *it was murder not manslaughter*
- Cleantech is a case of macro events coinciding with institutional entrepreneurship
- Loose definitions and categorizations can help new institutions in their early days
- Legitimacy was established through mimicry (symbolic isomorphism) & influence of specific actor groups (VCs)
- Side effects of its success include the charge of cleantech being a fad and bubble
- Frames change over time and contain conflicting logics. Conflicting logics can actually help in the creation of new industries as it attracts interest and attention.
- The skill of the institutional entrepreneur is one of adaptability, boundary-spanning and continual re-framing and narrativization.
- Whether or not we see any "big wins" in cleantech, the construct has helped re-frame the potential for technology, innovation and the entrepreneurial ecosystem to address critical environmental and social issues.