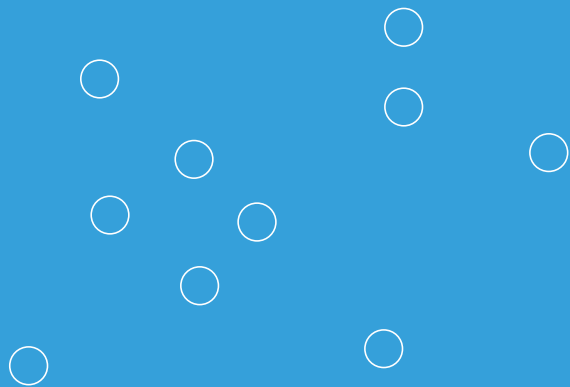


Hopes, Hypes & Disappointments – The Social Dynamics of Expectations



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Overview

- function of expectation dynamics in innovation processes
- project approach investigating expectation dynamics within and between different actor groups contributing to fuel cell innovation
 - preliminary results:
 - discourse analysis of FC expectations
 - innovation activities
- impact of different types of disappointment on innovation activities

- ? similar dynamics related to the
 - emergence and development of innovative concepts of IT use
 - dynamics of expectations on technological concepts, applications etc.

expectation dynamics & innovation processes

exp. dyn. & innov.

FC expectations

FC innovation activities

types of disappointment

conclusion

- (radical) innovations: high **uncertainty**
 - technological characteristics
 - application scenarios
 - economic potential and business models
 - socio-technical scenarios and societal impacts

- innovation actors have to rely on **expectations** rather than knowledge

- **collective** expectations
 - mutual orientation of actors
 - shared expectations, contested expectations

- **expectation dynamics**, e.g. hype-disappointment cycles

functions for innovation processes

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FC expectations

FC innovation activities

types of disappointment

conclusion

■ motivation & legitimation

- core actors with high stakes / others
- taken-for-granted expectations

■ orientation

- which technologies, applications, business models?
- which context?

■ shaping

- research and funding agendas, technologies, applications

■ coordination

- heterogeneous actors: producers, R&D, financial actors, funding organisations and regulators, users
- particularly important for emerging / radical technologies
 - when other coordination mechanisms – common technological frames, shared role models, institutionalised incentive structures are missing

Coordination at different stages of an innovation field

- exp not yet stabilised: mutual positioning
- common agenda: obligatory point of orientation
 - alignment of strategies
 - promising potential
 - adaptation to the ‚inevitable‘
 - free-riding
 - image
 - contestation
- materialisation and institutionalisation
 - artefacts and systems
 - actor networks, supporting institutions
 - use practices
- --> increasing irreversibility of expectations and technologies

Specific role of consultants?

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FC expectations

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conclusion

■ important intermediaries in

➤ the emergence of collective expectations

- providers of forecasts on market potential of particular technologies, applications, use and business concepts
- forecasts convey objectivity, create common reference point

➤ enacting expectation dynamics in innovation

- consulting projects promoting or even implementing particular technologies, applications, use and business concepts

SNF-Project *Hopes, Hypes & Disappointments* – lessons from stationary fuel cells

■ Research Questions

- How did **collective expectations evolve** in **different arenas** influencing stationary fuel cell innovation?
 - discourse analysis
- How did expectation dynamics influence **strategies** and **concrete projects** of innovation actors?
 - qualitative interviews
 - manufacturers, suppliers, utilities, financial actors, intermediaries, funding organisations, scientists
- How are expectation dynamics in **stationary and mobile fuel cells** related?

■ Partners

- University St. Gallen: financial actors
- Austrian Research Center, Vienna: mobile FC

fuel cells

produce energy from hydrogen

3 application domains

- mobile: cars, buses, forklifts, ...
- stationary
 - energy provision of buildings (heat, electricity)
homes, small businesses
 - power stations
- portable: handys, laptops



Preliminary findings from discourse analysis

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- analysis of attention cycles (quantitative) and expectation dynamics (qualitative) of different arenas
 - mass media, professional circles, policy, financial actors, science
 - quantitative indicators: # articles, but also financial flows of private investment or public funding
 - differences, commonalities and interrelations
 - dynamics, specific expectations, framing
- **Scope**
 - stationary (and mobile) applications
 - German speaking Europe
 - 1993-2006
- **Sources**
 - major daily and weekly newspapers, professional magazines, newsletters, funding programmes, financial press, investment reports
- analysis of innovation activities
 - R&D projects, support programmes, conferences

Expectations: Different types

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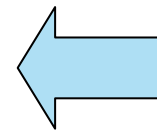
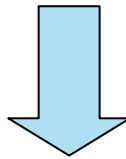
FC expectations

FC innovation activities

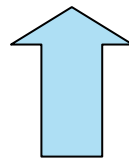
types of disappointment

conclusion

frames / interpretation schemes
=> scenarios for the technology,
justification context

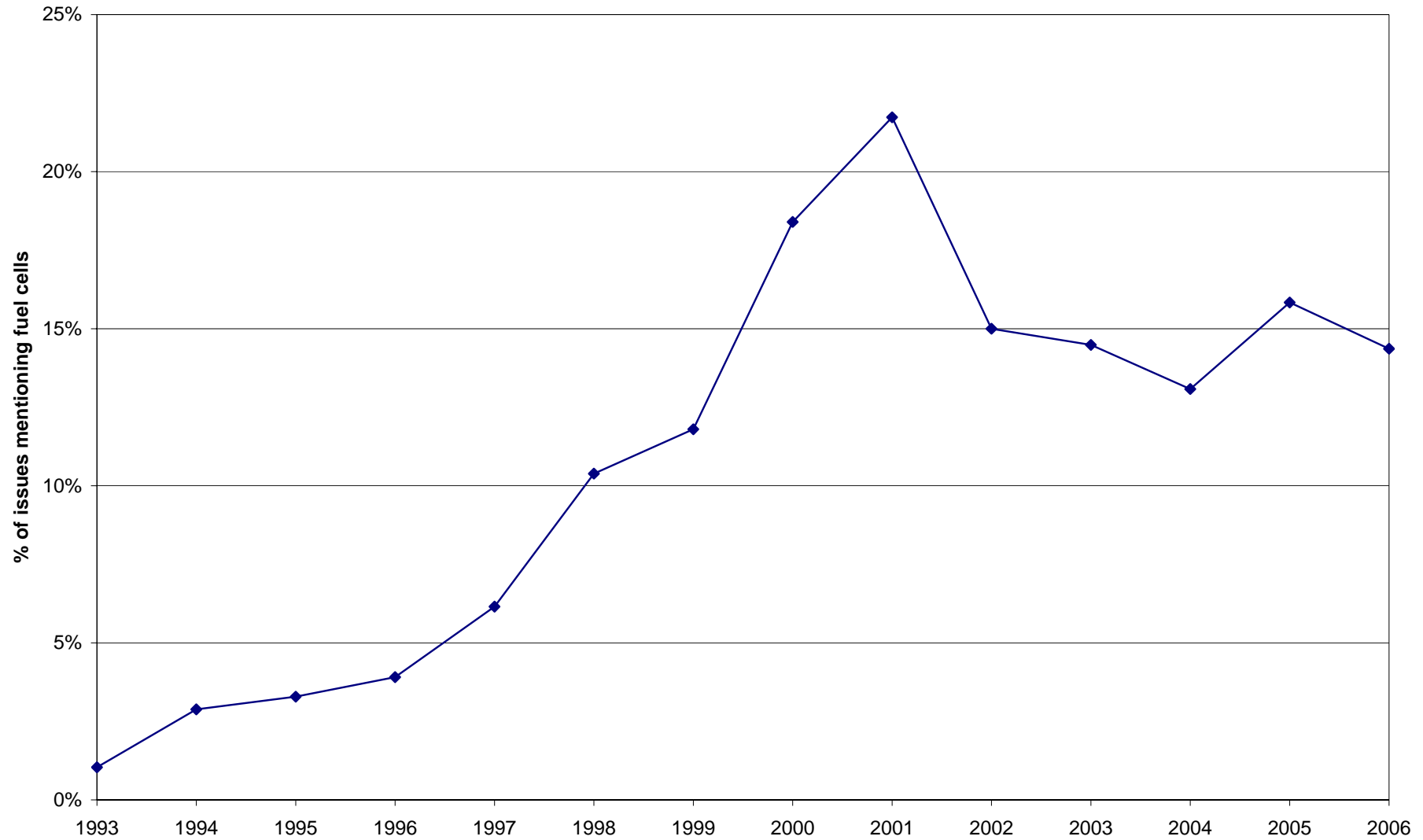


generalised expectations
=> types of technology,
applications

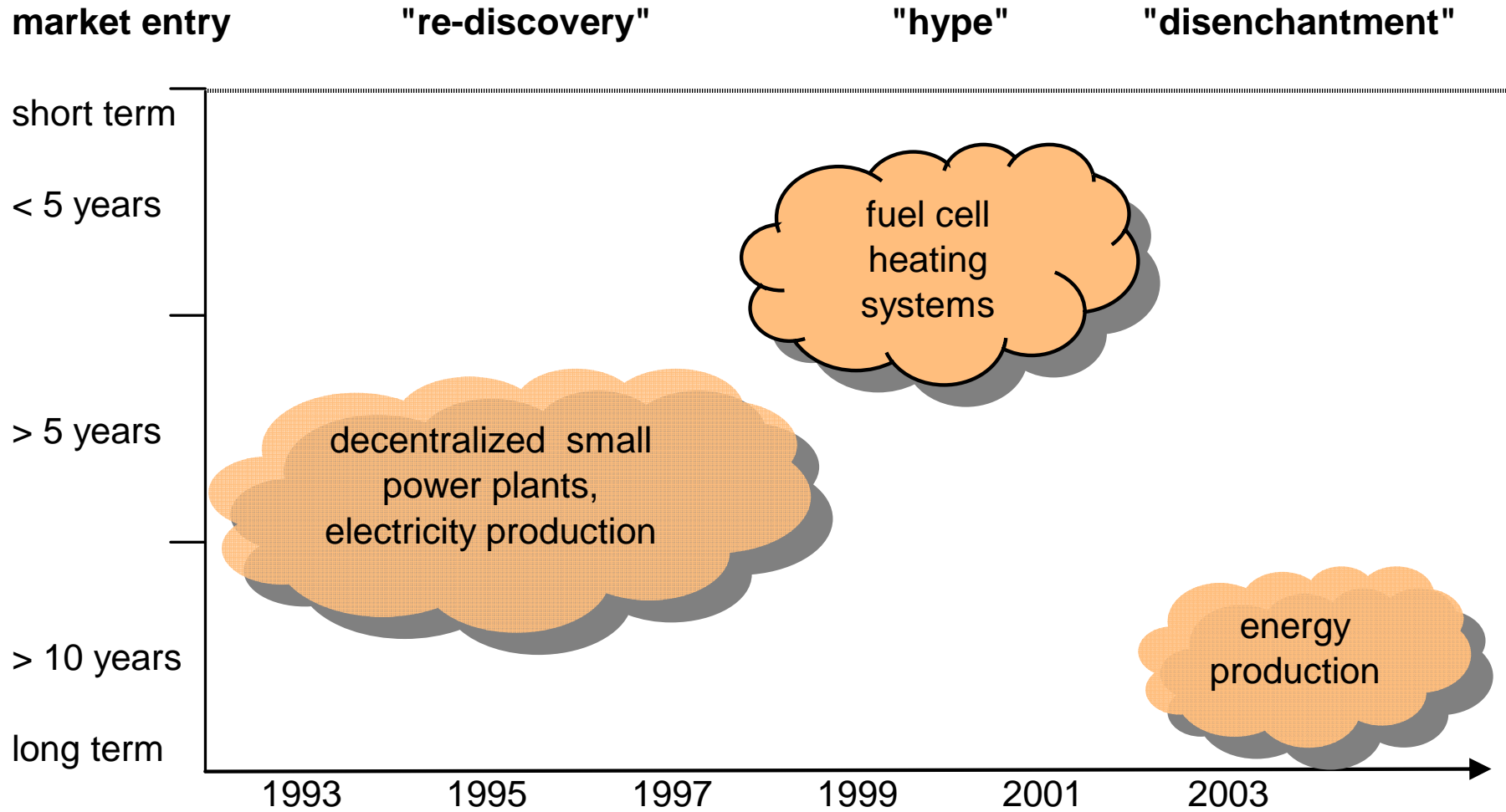


specific expectations
=> products, projects

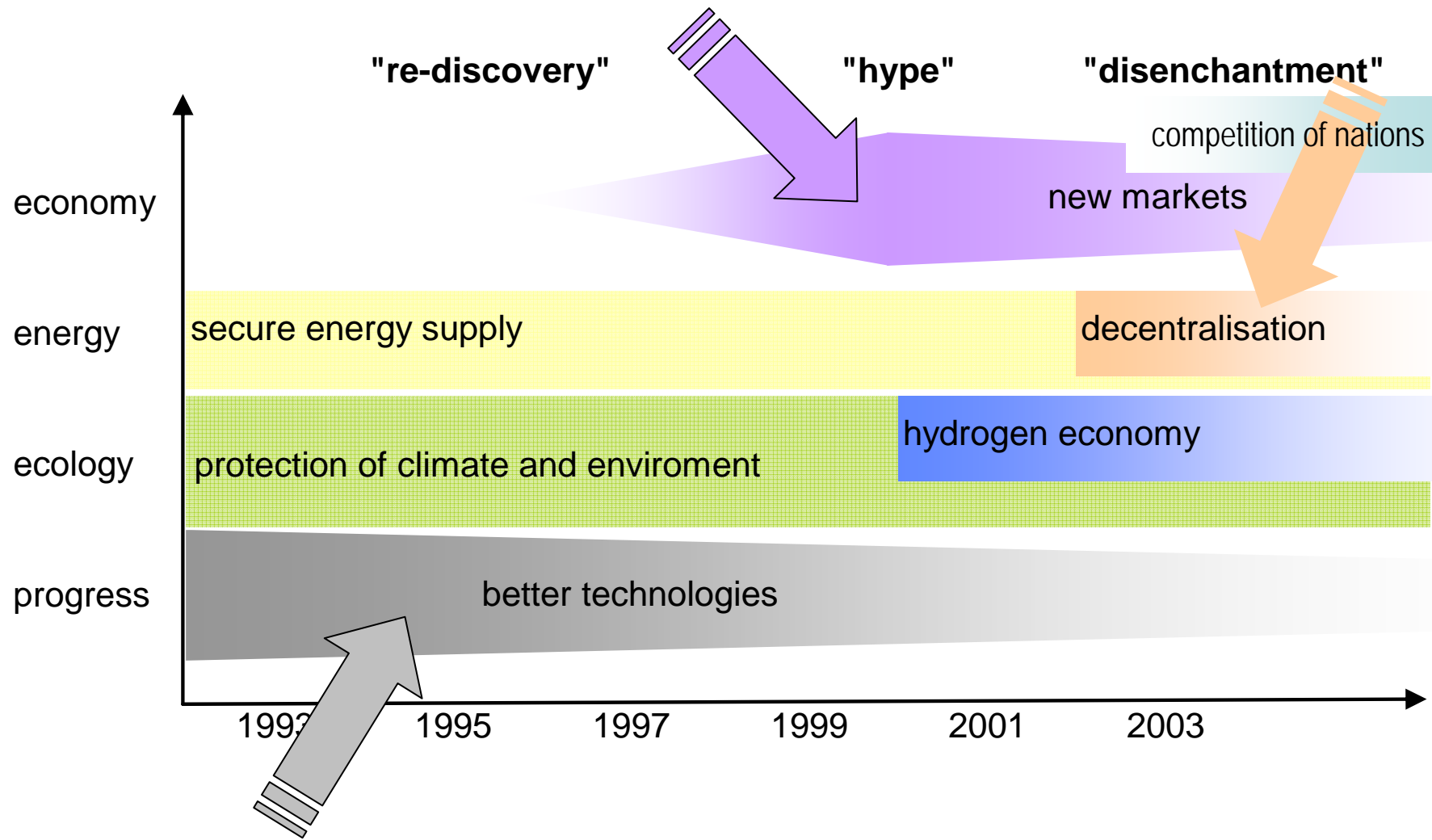
attention cycles: German-speaking mass media



hype-“disappointment“ dynamic



framings



attention cycles: professional magazines

exp. dyn. & innov.

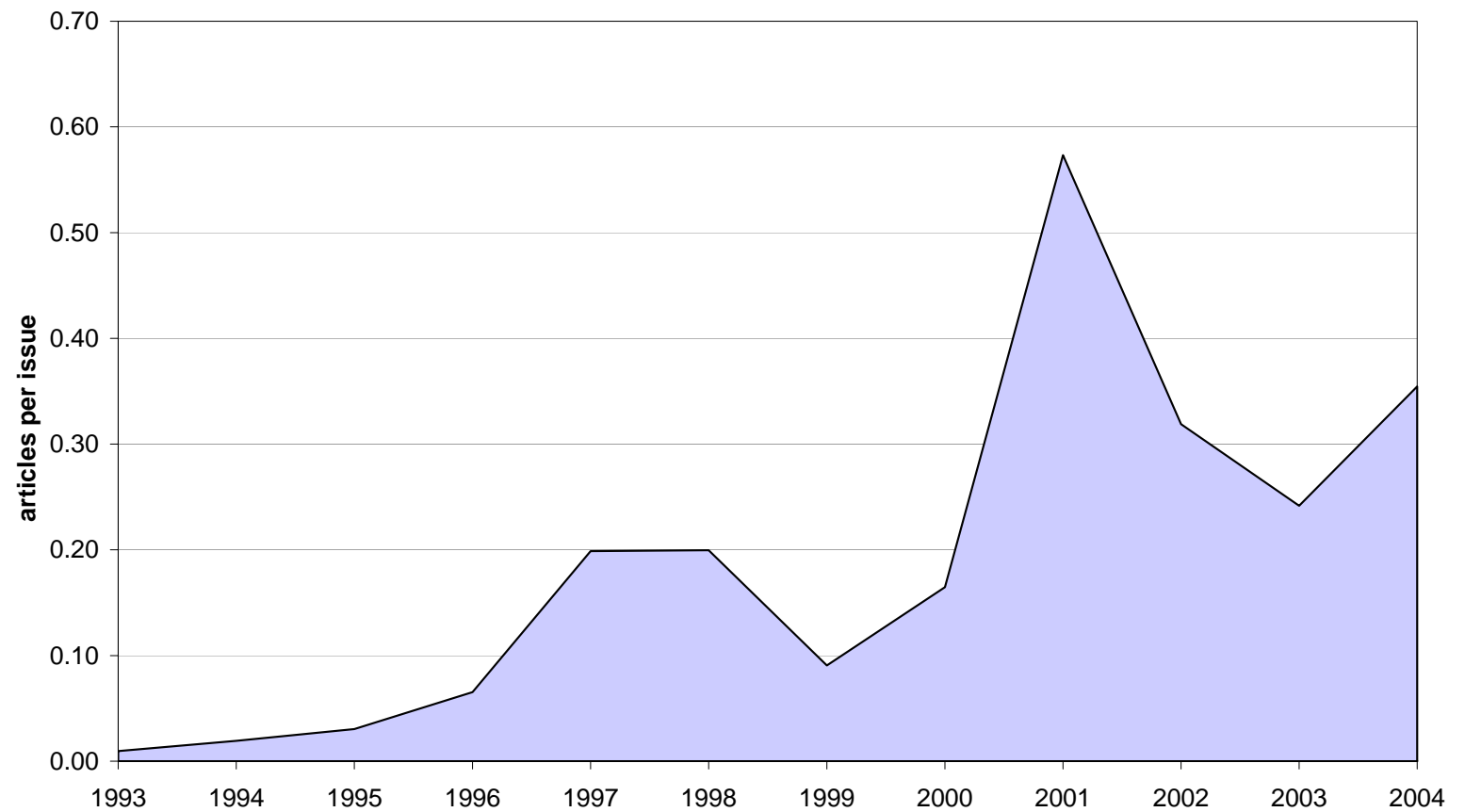
FC expectations

FC innovation activities

types of disappointment

conclusion

Fuel cell articles in professional magazines



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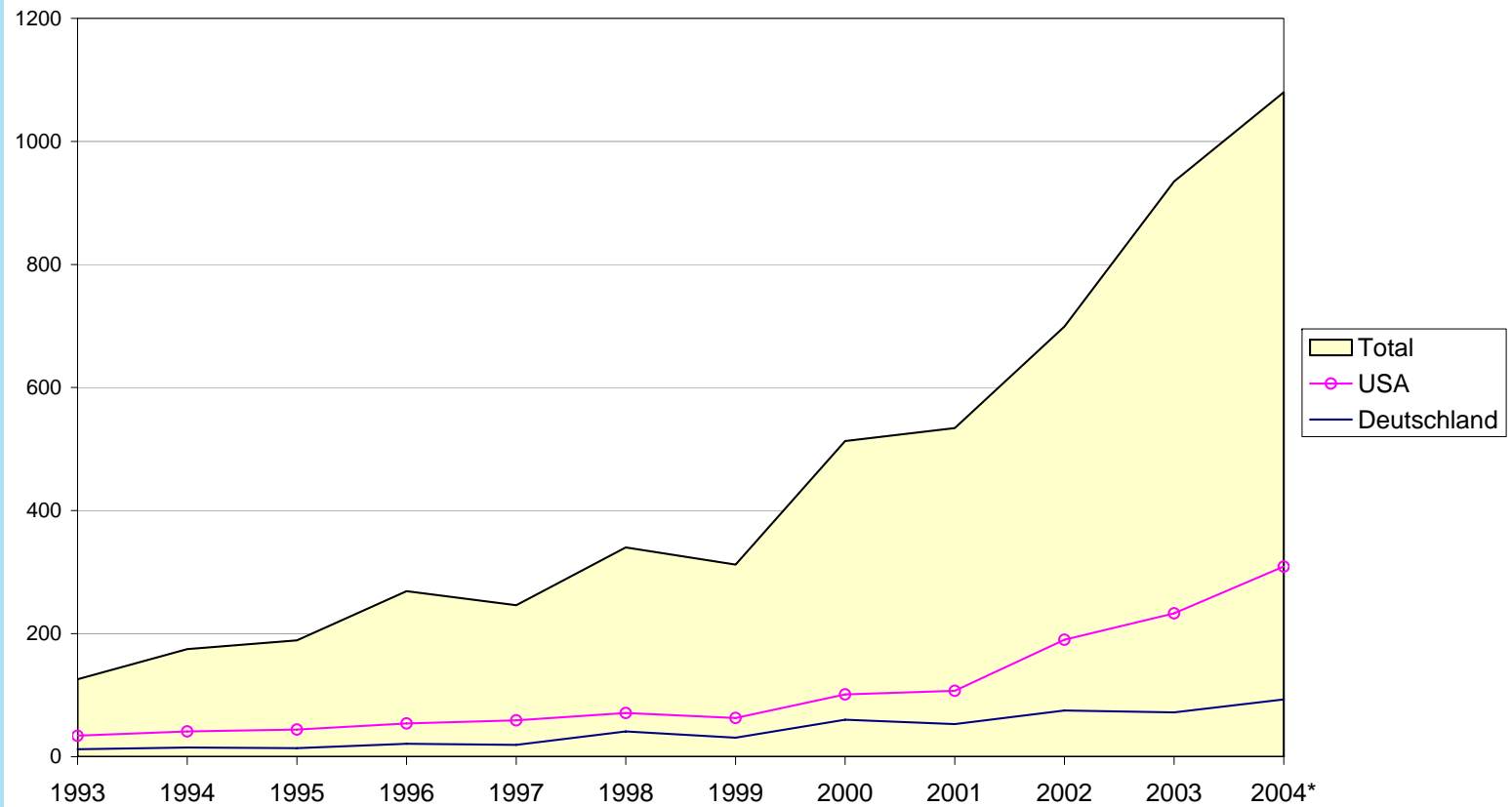
FC expectations

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Innovation activities in stationary FC

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FC expectations

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types of disappointment

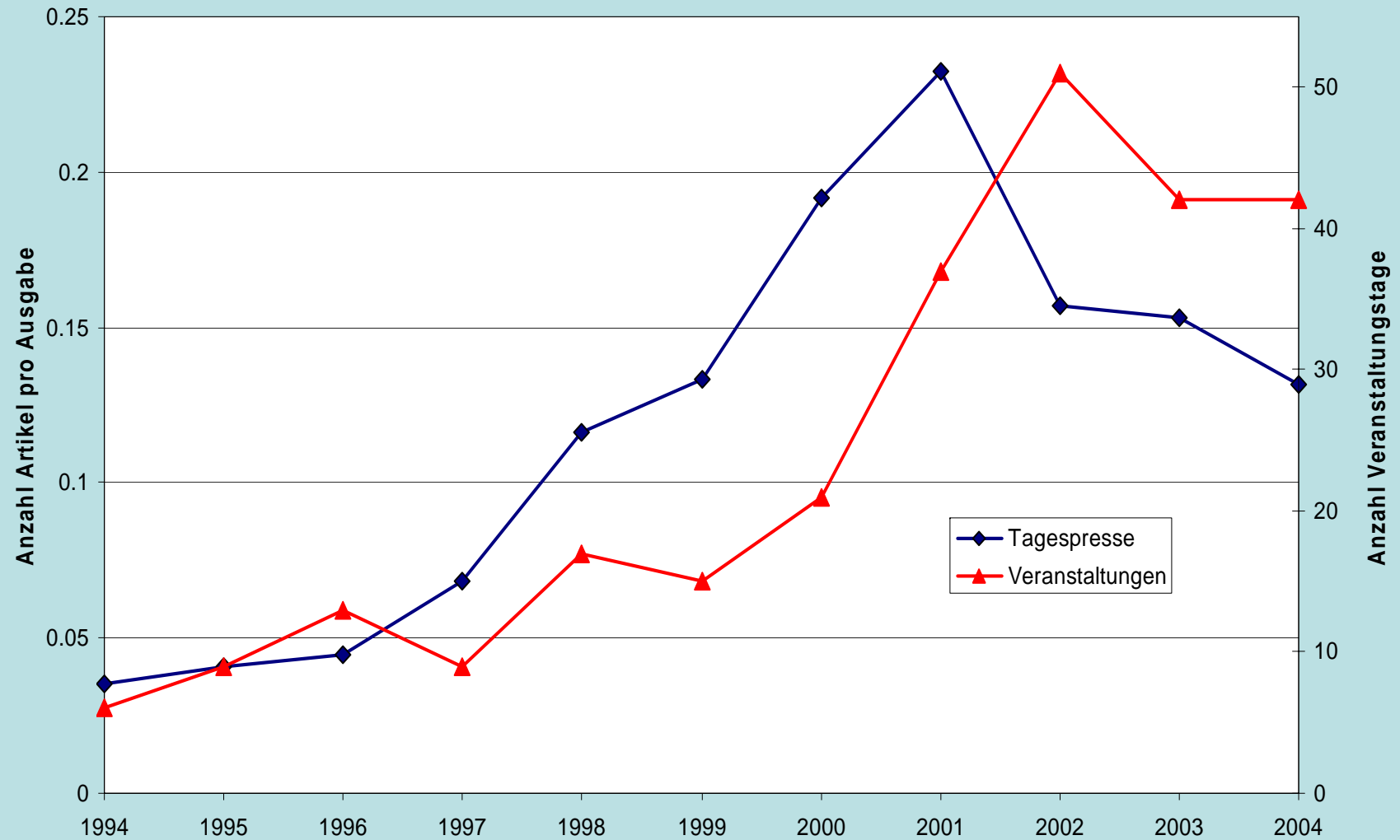
conclusion

Conference activities in German speaking Europe

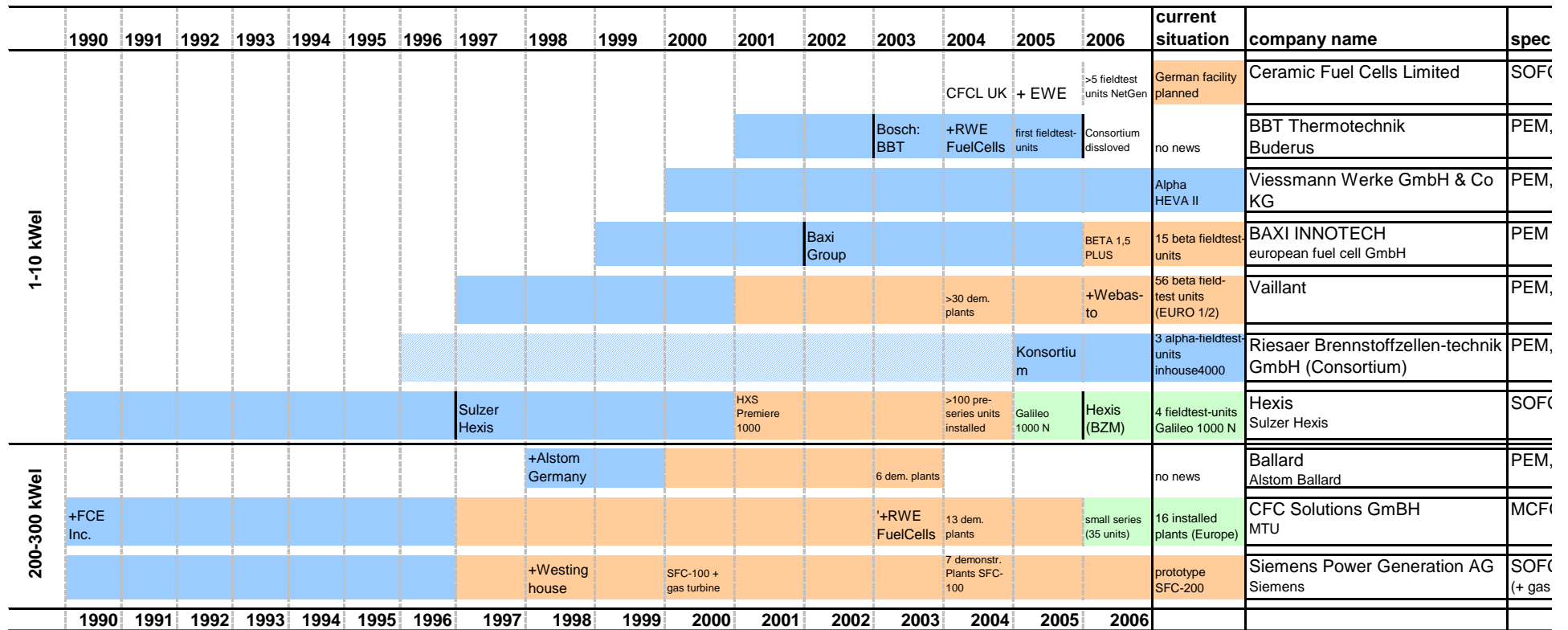
| 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | <i>Current name of the event</i> |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|
| | | | | | | | | | | | | | | Dresdner Wasserstofftag |
| | | | | | | | | | | | | | | Experten-Workshop Zulassungs- und Sicherheits-Fragen (WBzU) |
| | | | | | | | | | | | | | | France - Deutschland: Fuel Cell Conference |
| | | | | | | | | | | | | | | Internationaler Deutscher Wasserstoff-Energietag |
| | | | | | | | | | | | | | | Brennstoffzellen-Technologietag Aachen |
| | | | | | | | | | | | | | | Brennstoffzellenforum Rheinland-Pfalz |
| | | | | | | | | | | | | | | Jahrestreffen Kompetenz-Netzwerk BZ und Wasserstoff NRW |
| | | | | | | | | | | | | | | Brennstoffzelleforum Hessen |
| | | | | | | | | | | | | | | Brennstoffzellenkongress der Energiewirtschaft (HEA) |
| | | | | | | | | | | | | | | f-cell Forum Brennstoffzelle Stuttgart |
| | | | | | | | | | | | | | | H2-Expo Hamburg |
| | | | | | | | | | | | | | | European PEFC Forum; European Sust. Energy Forum (Lucerne) |
| | | | | | | | | | | | | | | Brennstoffzellen-Symposium Wuppertal (NRW) |
| | | | | | | | | | | | | | | Lucerne Fuel Cell Forum |
| | | | | | | | | | | | | | | Euroforum-Jahrestagung Brennstoffzellen |
| | | | | | | | | | | | | | | VDI-GET Fachausschuss Brennstoffzellen |
| | | | | | | | | | | | | | | Hannover Messe Group Exhibit Hydrogen + Fuel Cells |
| | | | | | | | | | | | | | | Fachforum Brennstoffzellen (OTTI-Kolleg) |
| | | | | | | | | | | | | | | European SOFC Forum (Lucerne) |
| 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | |

bi-annual annual

attention cycles and conferences



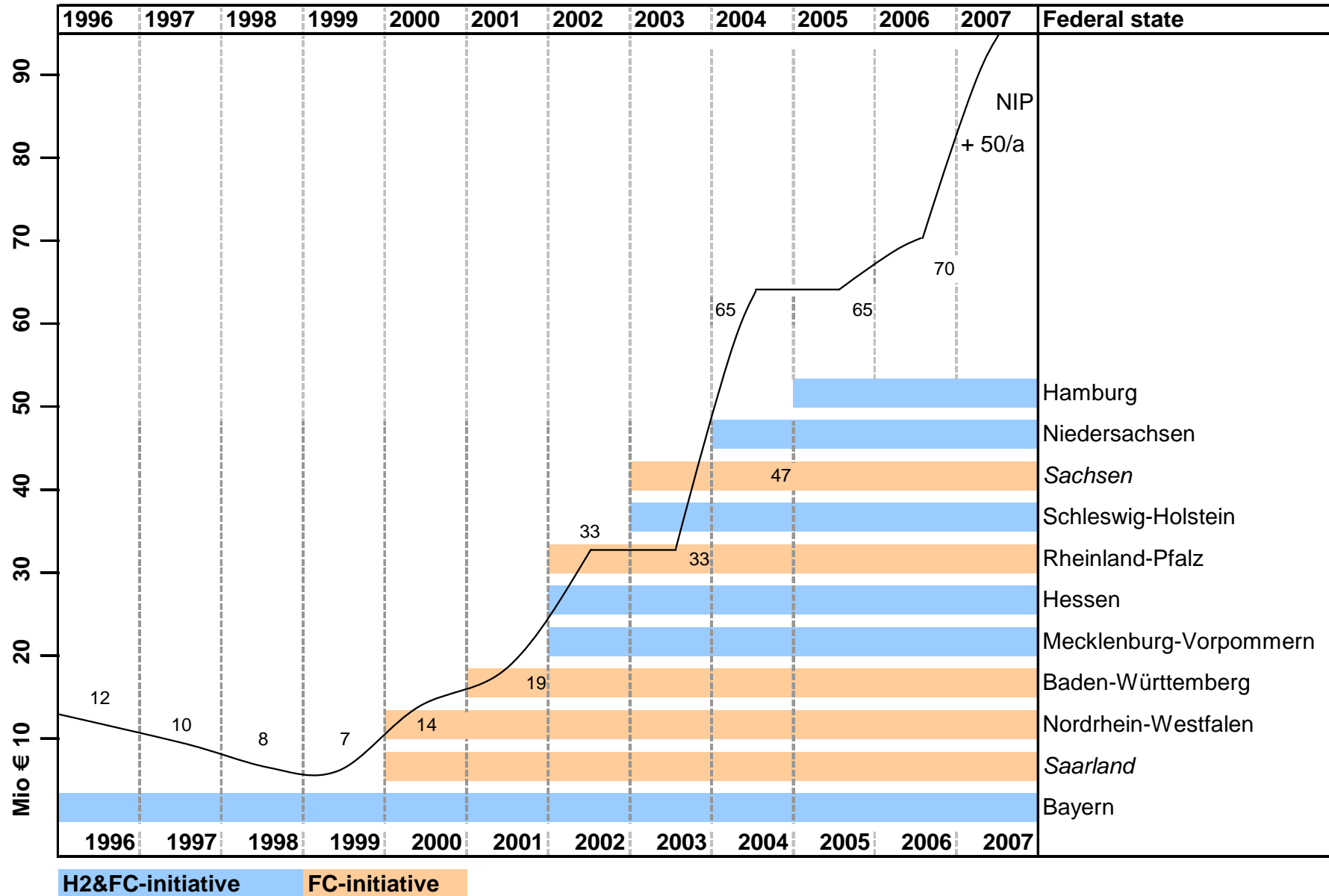
Industry R&D projects on stationary FC (active in Germany)



not clear/labor phase (F&E)
 alpha phase (prototypes)
 beta phase (field tests)
 gamma phase (small series)

+ Joint Venture
 | takeover by company

Public funding (Germany)



Contradiction??

exp. dyn. & innov.

FC expectations

FC innovation activities

types of disappointment

conclusion

- downscaling of expectations on stationary fuel cell market potential (time horizons)
- ongoing innovation activities
- contradiction to other cases where disappointment is related to strong reduction of innovation activities?

- 2 reasons for sustained innovation
 - downscaling of generalised expectations, yet still positive framing of the technology
 - supporting institutional structures have emerged during hype phase
 - innovation networks
 - formation of associations and committees
 - set-up of public research programmes and funding schemes

As a conclusion ...

- Can we observe **collective expectations and hype dynamics related to concepts of IT use**?
- If so, how do these **affect implementation and diffusion of these concepts**?
- May we ascribe a **coordinating effect of IT use concepts in IT innovation**?
- What about **diverging perceptions** of these concepts in different actor groups?
- How are expectations concerning **different concepts related**?
- May we assume a **similar relationship between expectations at different levels** (particular concepts, framings) related to IT use concepts and **realisation efforts** as presented for the fuel cell case?

Thank you very much for your attention!

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See also:

Konrad, K. (2006). The Social Dynamics of Expectations: the Interaction of Collective and Actor-Specific Expectations on Electronic Commerce and Interactive Television. Technology Analysis & Strategic Management 18(3/4), 429-444.

Konrad, K. (2006). Shifting but forceful expectations: structuring through the prospect of materialisation, Paper presented at the VII Twente Workshop, Oct 2006

Ruef, A., Markard, J. What happens after a hype? How changing expectations affected innovation activities in the case of stationary fuel cells. submitted to Technology Analysis & Strategic Management.