

**“Globalization and Open Innovation”
- Implications for Innovation and Technology Policy -**

Dr. Dirk Meissner

Scientific Advisor

Swiss Science and Technology Council

Inselgasse 1, 3003 Bern

Tel. +41 31 322 96 73

Fax +41 31 323 95 47

Dirk.Meissner@swtr.admin.ch

Information contained in this presentation is confidential. Prior to any publication the authors' institutions reserve the right for approval of all data / information processed and used for publication referring to information provided in the document.

Executive summary (1)

- Project description
 - Project was the Swiss contribution to a larger OECD project involving 59 company case studies across 13 countries
 - Swiss case studies with 10 leading global companies with operations in Switzerland
- General observations
 - Open Innovation is considered important and related initiatives will increase
 - Innovation is broader than R&D (beyond R&D, beyond manufacturing)
 - Best-practice examples show different approaches on how to create value
 - Open Innovation influences strategy, organization, processes and mindset
 - Switzerland is well positioned to host open innovation activities
 - Openness of a country is precondition to keep and attract investment in innovation activities
- Conclusions for innovation policy
 - Innovation policy has to ensure focused education and international openness
 - Changes in governance of science, technology and innovation policy (coherence, public/private) are required
 - Networks/clusters policies have to focus on technology instead of industries
 - Regular evaluation of national innovation policy in international context is required
 - Human resource capacity building requires additional competences
 - IPR regulation need to cover various forms of cooperation between different actors to support open innovation

Executive summary (2)

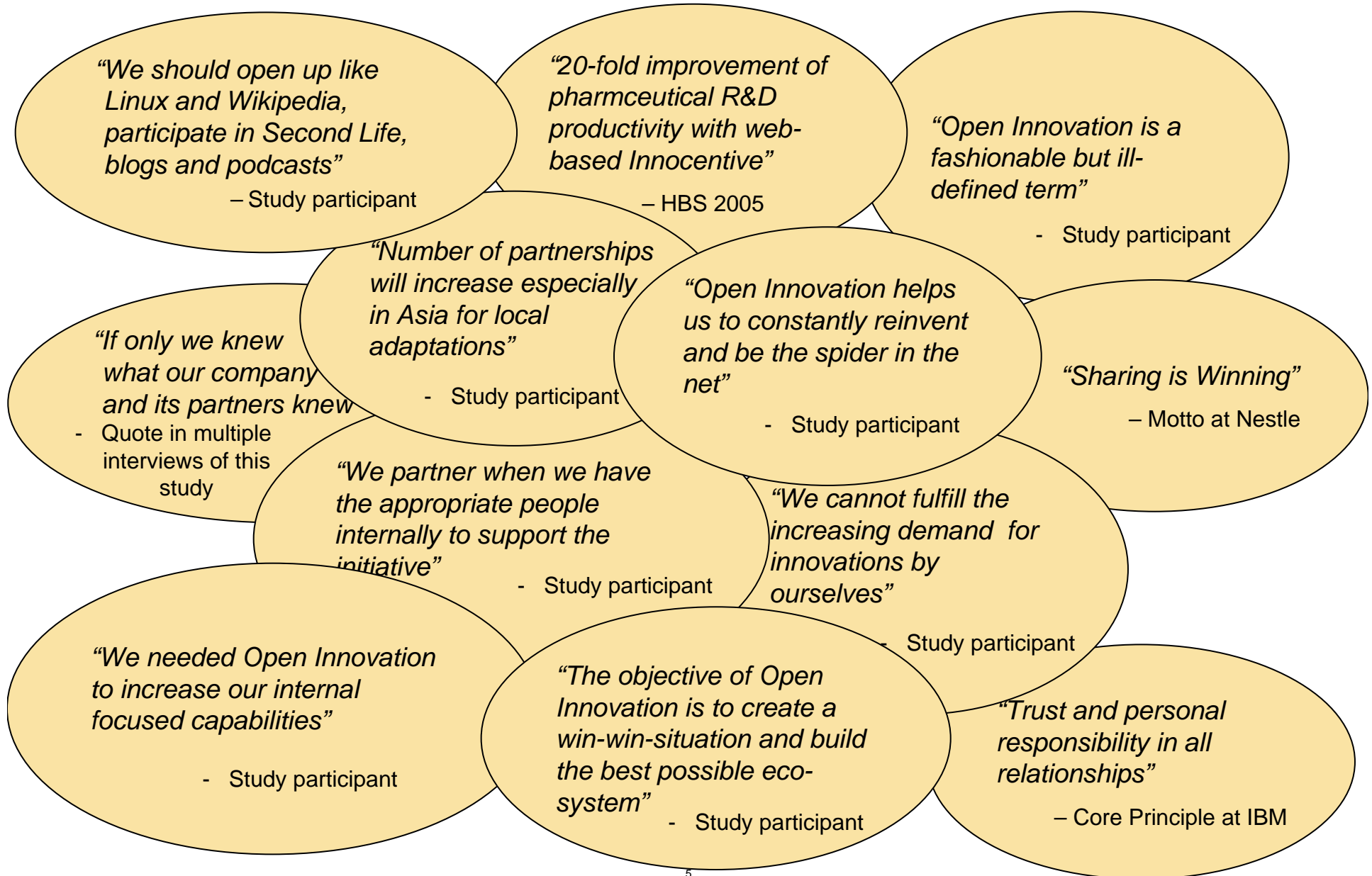
- Conclusions for innovation policy (ctd.)
 - Strengthen and make more efficient use of industry – science relationships
 - ✓ Adapt legal framework for academia more to global challenges (i.e. sabbaticals for researchers without pressure of publication counts)
 - ✓ Measurement of collaboration culture on academia side to elaborate future measures
 - ✓ Design of incentive systems for academia to engage more in industry science relationship – influence academic culture and academic values
 - Public-Private Partnerships – leverage R&D investment
 - ✓ Public support of Public-Private Partnerships proves effective in leading countries – e.g. Netherlands (LTI); Sweden (Vinnova-ExCenter); Ireland (CSET)
 - ✓ Follow cluster approach – industrial R&D goes where clustered knowledge is available; critical mass counts
 - Spin – Out, New Business Development
 - ✓ Adjust Swiss legal framework conditions esp. tax and labor related
 - ✓ Liability issues to be reformed
 - ✓ Support Entrepreneurship thinking in primary education

Content

- 1 Introduction — Open Innovation Context and Study Design**
- 2 Results — Status of Open Innovation
- 3 Implications — When to Consider Change in Open Innovation Practice
- 4 Recommendations by study participants —Innovation Policy

Introduction — Open Innovation Context and Study Design

Open Innovation — Myth or Revolution?



Introduction — Open Innovation Context and Study Design

Study context and objectives

Globalization and Open Innovation — Core challenges for Innovation and Technology Policy

- Does globalization of R&D change companies' innovation strategies?
- Do companies implement an open innovation strategy and how (e.g., cooperation with universities, start-ups, suppliers, customers, and competitors)?
- What are difficulties and potential solutions regarding open innovation?
- Does this all require changes in government policy?

Study design



In charge of overall study including desk research and coordination of all participating member countries.



Center for Science and Technology Study which is affiliated to the Swiss Science and Technology Council (SWTR) responsible for the study execution in Switzerland and the preparation of recommendations for Swiss innovation policy.



The global management consultancy which is focused on growth has been asked to support the study in Switzerland and to ensure the benefits for participating companies and the Swiss economy in total.

Introduction — Open Innovation Context and Study Design

Study set-up

Participating Companies



Swiss Re



Methodology

- Study has been conducted between April and July of 2007
- Interviews plus questionnaire with 19 executive managers of 10 leading global companies with significant operations in Switzerland
- Creation of case studies on each company and best practice examples on open innovation activities
- Presentation of results to OECD, participants, Swiss companies and Swiss policy makers

Content

- 1 Introduction — Open Innovation Context and Study Design
- 2 Results — Status of Open Innovation**
- 3 Implications — When to Consider Change in Open Innovation Practice
- 4 Recommendations by study participants —Innovation Policy

Results — Status of Open Innovation

Open Innovation is . . .

Open innovation is a fashionable explanation of the innovation process. Open innovation stresses collaboration of innovators in different phases of the innovation process with external parties, the systematic use of external sources for innovation and the exploitation of innovations outside companies' core innovation activities.

Results — Status of Open Innovation

Open Innovation is seen as beneficial in many ways . . .

- Complement internal know how or build critical mass on target growth platforms
- Maximize idea sources — diversity of opinions including other industries
- Get insights adjacent to core competences
- Access leading experts, entrepreneurs and networks around the globe
- Seek alternative and / or complementary solutions to own developments
- Accelerate development cycles in accordance with strong demand by shareholders
- Allow faster reinvention by entering new markets and leaving commoditized markets
- Handle increased complexity in many fields of innovation
- Access public funding and influence policy directions
- Fulfill market requirements, i. e., for open standards
- Use as marketing and branding instrument, e.g., to quickly create broad market demand
- Promote position as preferred partner in the industry
- Share cost of development and risk of failure — usually with longer term potential (significant impact for basic research)
- Achieve required economies of scale when building up new markets
- Involve all stakeholders (regulatory authorities, institutions, partners etc.)
- Use as source for new hires
- Empower internal entrepreneurs
- Provide easy access and powerful synergies in regional cluster communities

Results — Status of Open Innovation

. . . but Open Innovation has limitations, too

Limitations and Challenges	Examples and Quotes
Core competencies are fully covered internally	<i>“We have consolidated our platforms in which we have most knowledge, thus we need less externals”</i>
Company culture does not accept external superiority	<i>“We still have to fight with Not Invented Here”</i>
Interface problems between units, geographies etc. (additional complexity)	<i>“It is easier to go next door . . .”</i>
Lack of internal resources to optimally support external activities	<i>“Every external project is linked to a dedicated internal team to ensure standards and alignment”</i>
Measurement of benefits is difficult	<i>“The advantage of collaboration is often only visible in the long term”</i>
Difficulty to define the problem or need	<i>“We have difficulties to get a common understanding of the needs”</i>
Number of start-ups and other potential cooperation partners is small	<i>“In our capital intense industry there are not many potential partners who are not competitors”</i>
Each communication with externals can lead to patent litigations	<i>“Our employees are not allowed to sign confidentiality agreements or publish articles without approval by the IP department”</i>
Public funding programs for Open Innovation with multiple partners are often too bureaucratic and time-consuming (especially European programs)	<i>“We do not use these programs anymore which is a pity because we see the potential”</i>

Results — Status of Open Innovation

Trend towards multi-partner relationships with customers and academics

Outside-in Open Innovation

Inside-out Open Innovation

Customers

- Most relevant source of ideas with increasing importance, often focus on lead users
- Customers become also more involved in financing of innovation
- However, it is not always possible to define emerging needs

Universities and Research Institutions

- Companies focus on fewer high quality relations to leading universities or individual professors
- Know how via PhD programs and new hires is important source

Start-ups, Consultants / Engineering Firms

- Usually not of major importance and only opportunistic screening of opportunities
- Global players rarely have a full overview but expect start-ups to approach them

Suppliers

- Importance increases with specialized capabilities in materials and development

Competitors (Co-opetition)

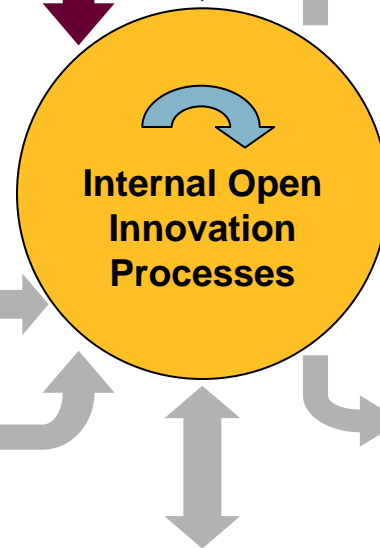
- Co-opetition is used in pre-competitive research, to create a new market to share cost and risk or to set industry standards
- Standard requirement in many European research programs

Spin Out

- Only for few companies relevant and usually the exception even there
- Few companies use spin out to market non-core inhouse technology

Out-Licensing Partner

- Mostly opportunistic activities by global companies due to potential applications internally
- Out-licensing equally done with small and big companies



Note: Boldness of arrows describes strengths of relationship including different perspectives from acquisitions and new hires

Results — Status of Open Innovation

New business models are gaining importance based on Open Innovation

Corporate Venturing

- Emerging activities, like the Venture Capital Funds of Novartis and Nestlé
- Some companies are rather reluctant due to significant losses in the past years

Incubator

- Support the entrepreneurial activities of internal and external start-ups
- Not very common yet but often plans to go in this direction
- Incubators are used to achieve long term targets and network relations
- Incubator can be organized around a new unit, acquired company or external funds

Spin-in

- Opportunistic activities, often based on existing academic contacts
- Spin-in often follows initial minority share investments
- Many potential difficulties need to be solved
 - technology integration and strategic fit
 - duplication of people and processes
 - contractual conditions and IP rights
 - transaction cost
 - inhouse-competencies to support the integration

Results — Status of Open Innovation

Internal processes have been adapted to enable Open Innovation

- Internet-based **idea generation systems** and electronic team rooms are often set in place, sometimes with access rights for selected partners. The value of these systems depends mostly on entry incentives and the follow up mechanism.
- “**Port of Entry**” with multiple connections to the outside world is crucial for success in Open Innovation. Ideally, all employees are aware of partnership benefits and act as scouts for ideas.
- Internally used **stage-gate-processes** are often implemented to assess external companies and project ideas. In some cases, manager can use “play money” to invest in external ideas up to a defined budget. Often, M&A department will become responsible if an investment needs to be made.
- Most companies use similar **criteria to select partners**:
 - Strategic and cultural fit and common objectives;
 - Confidentiality agreements and commercial targets;
 - Commitment by top management (and other levels with dedicated resources);
 - Proximity to relevant internal innovation group (only in some cases relevant).
- Open Innovation is usually considered “**everybody’s job**” but implementation often lacks the right incentives, measures and processes. Special training programs have often been established.
- Some companies have started to **dedicate units** to “Open Innovation”.
- **Freedom to act**, empowerment and continuous learning are well established in R&D; further importance is set on the dialog between Marketing/Sales and R&D.
- Key innovators and entrepreneurs are often rotated within the company to “**spread the virus**” across the different departments.

Results — Status of Open Innovation

Limited influence of Open Innovation on IPR strategies

IPR for Protection

- The patent strategy is usually closely linked to business strategy
- Strict protection of all IP around core technologies to assure “Freedom of Action” is key in MNEs
- Some universities (especially in the US) become too restrictive in IP protection
- Importance of patent portfolio management varies between companies and industries
- Open Innovation projects are often based on “Cover Collaboration Agreements”



Technology Out-licensing

- For most companies not in focus because they are big enough to find enough internal applications
- Some companies like IBM constantly seek for the best commercialization of patents



Open Standards

- In some cases important to secure market position or avoid monopolist situations
- Commercial success depends on right balance between openness and differentiation

Content

- 1 Introduction — Open Innovation Context and Study Design
- 2 Results — Status of Open Innovation
- 3 Implications — When to Consider Change in Open Innovation Practice**
- 4 Recommendations by study participants —Innovation Policy

Implications — When to Consider Change in Open Innovation Practice

Study participants have indicated similar priorities around Open Innovation

Priority 1

- Define Open Innovation as key element of the business strategy
- Involve customers and suppliers more regularly in innovations
- Define growth and technology platforms to focus activities
- Change mindset towards Open Innovation
- Establish structures and programs to enable open innovation

Priority 2

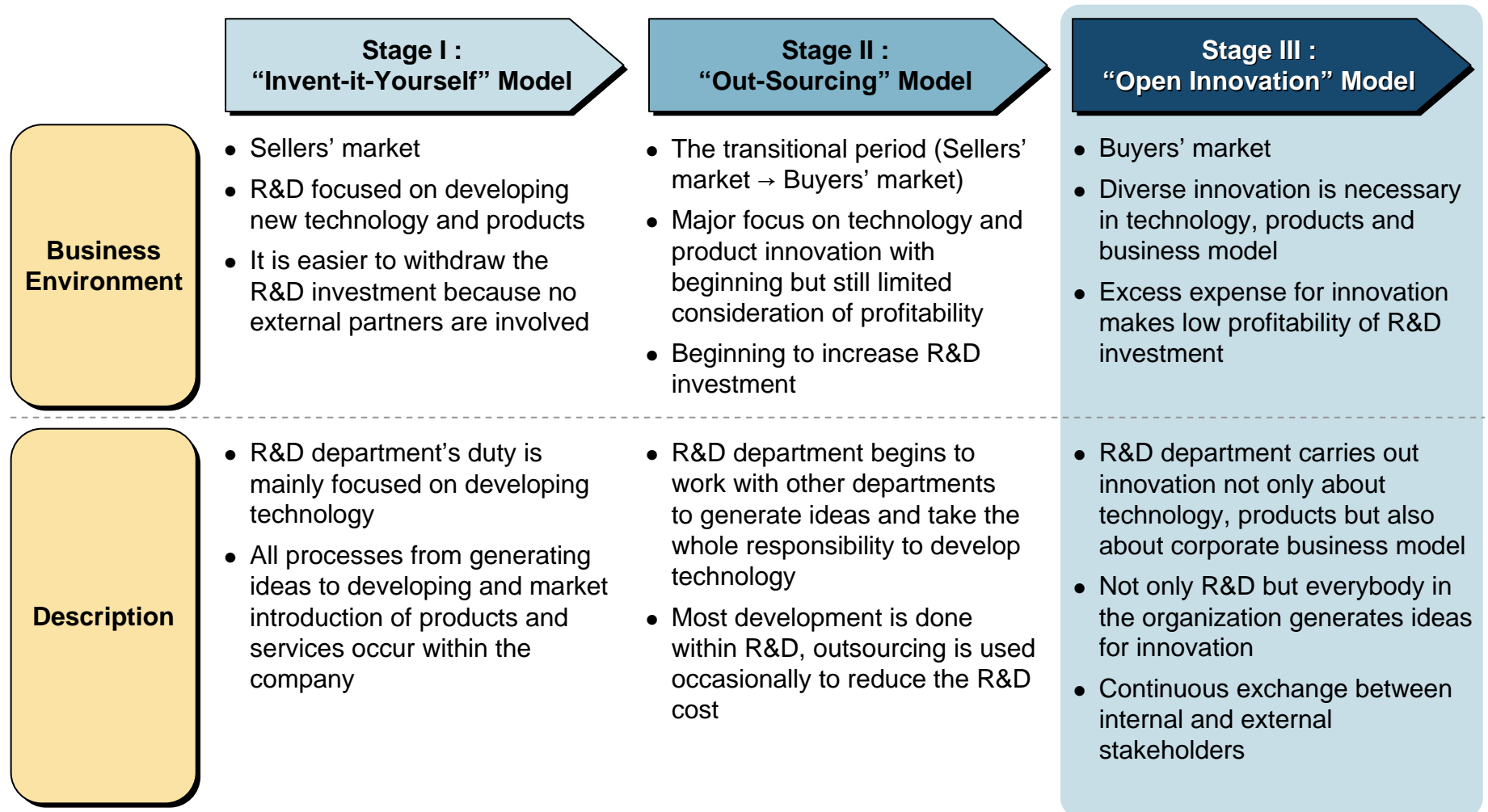
- Use multiple instruments for innovation (incubators, start-ups etc.)
- Define and agree on Open Innovation metrics (e.g., share of innovations based on external ideas; number of joint developments)
- Develop capabilities to enable Open Innovation
 - Scouting and screening of opportunities outside of “comfort zone”
 - Interface management for internal and external collaboration
 - Project management and business skills for each researcher

Note: Priority defined as mix of how often the factor was mentioned and how important it was for the individual companies

Implications — When to Consider Change in Open Innovation Practice

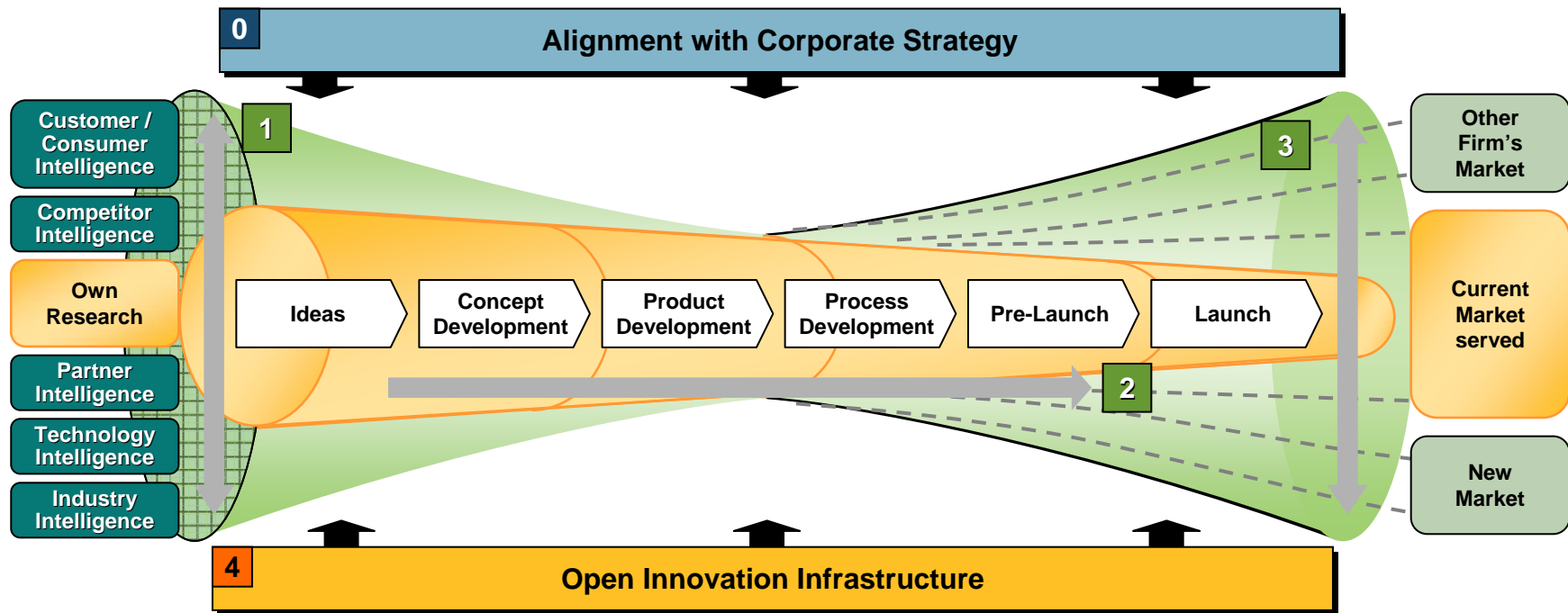
Move from own invention via out-sourcing towards Open Innovation

The Transition of Innovation Due to the Change In Business Environment



Implications — When to Consider Change in Open Innovation Practice

Open Innovation Covers the Entire Innovation Process



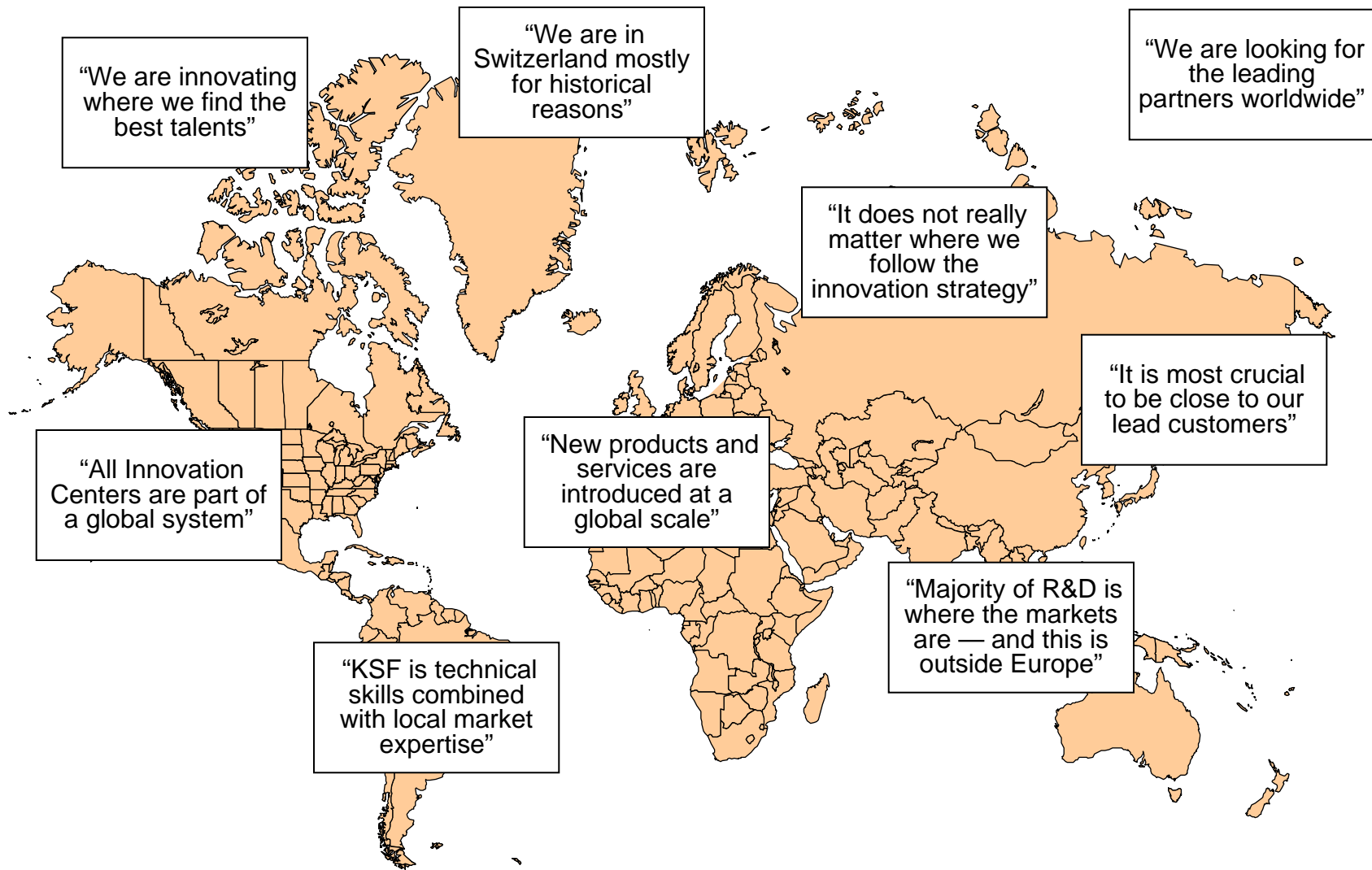
0 Alignment with Corporate Strategy	1 Inbound Increase	2 Effectiveness Increase	3 Outbound Increase	4 Open Innovation Infrastructure
<ul style="list-style-type: none"> Align the missions of R&D with corporate strategy and its changes over time 	<ul style="list-style-type: none"> Secure diverse access to the ideas of growth opportunities by expanding Idea Generation Pool 	<ul style="list-style-type: none"> Enhance Innovation Effectiveness and Hit Ratio based on business development capabilities 	<ul style="list-style-type: none"> Active commercialization of technologies identifying cross market opportunities and selling out IP 	<ul style="list-style-type: none"> Metrics, culture and other infrastructure that enables open innovation

Content

- 1 Introduction — Open Innovation Context and Study Design
- 2 Results — Status of Open Innovation
- 3 Implications — When to Consider Change in Open Innovation Practice
- 4 Recommendations by study participants —Innovation Policy**

Recommendations by study participants — Innovation Policy

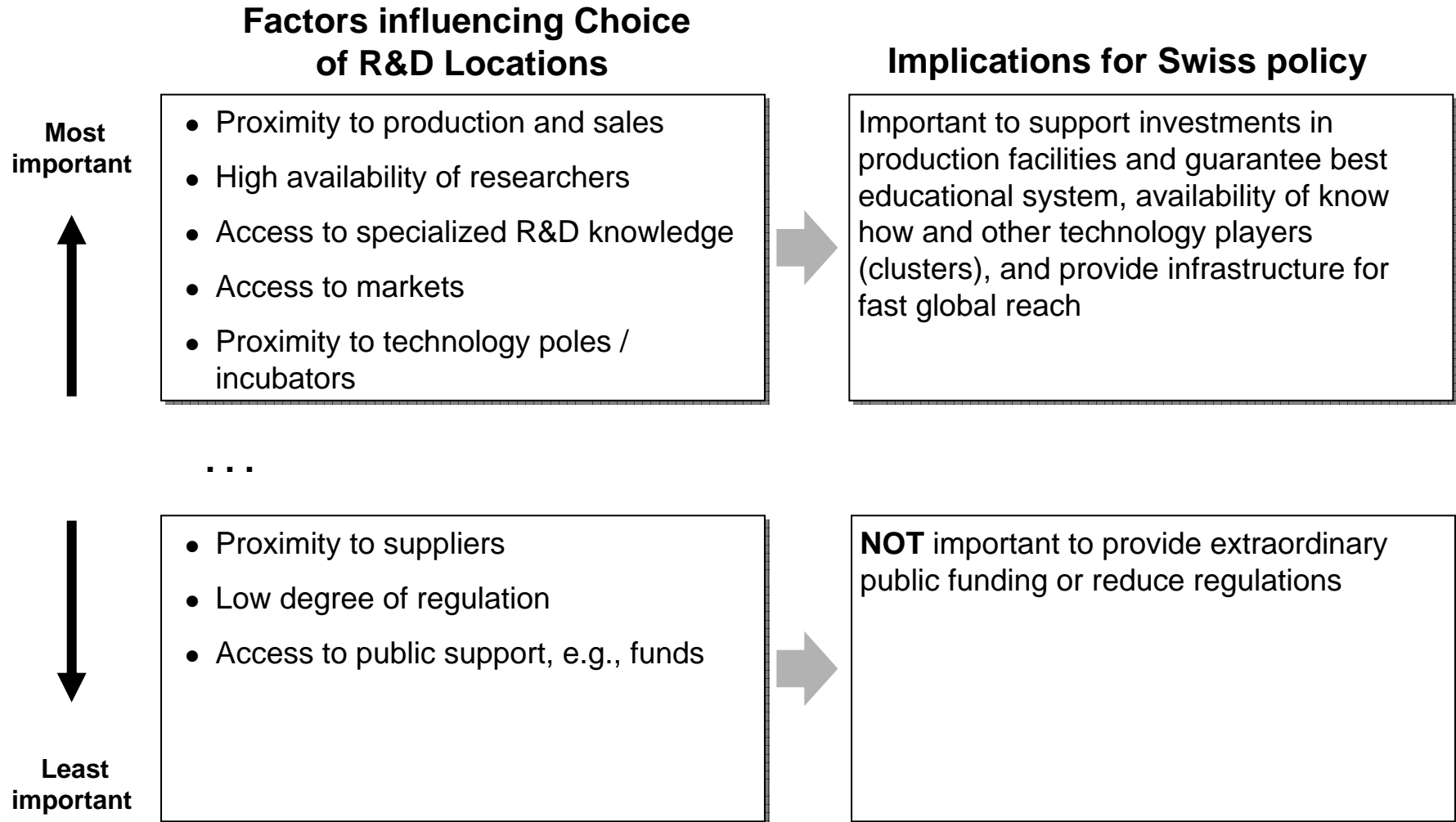
Treat Open Innovation as a global topic



Source: participant statements

Recommendations by study participants — Innovation Policy

Companies will innovate where they find the relevant know how



Recommendations by study participants — Innovation Policy

Build on national advantages

Observations from company case studies	Conclusions for Swiss innovation policy
<ul style="list-style-type: none"> • Most of the companies have the headquarter here for traditional reasons 	<ul style="list-style-type: none"> • Continuous monitoring — satisfaction analysis
<ul style="list-style-type: none"> • Swiss tax and investor policy is favorable to invite headquarters of large companies 	<ul style="list-style-type: none"> • Analysis and extension to broader investor policy
<ul style="list-style-type: none"> • Quality of life is excellent (including security, cleanness, leisure opportunities etc.) 	<ul style="list-style-type: none"> • Keep standard
<ul style="list-style-type: none"> • Location is good to cover European market (communication and coordination cost) 	<ul style="list-style-type: none"> • Further extend to new markets in central Europe
<ul style="list-style-type: none"> • Infrastructure for global businesses is good (but not excellent) 	<ul style="list-style-type: none"> • Infrastructure analysis for global businesses
<ul style="list-style-type: none"> • Excellence in some universities — “research stays where know how is generated” — excellent rate of university start-ups generates important entrepreneurs 	<ul style="list-style-type: none"> • Strengthen excellence and support critical mass initiatives
<ul style="list-style-type: none"> • Trusted relationships with local partners 	<ul style="list-style-type: none"> • Facilitate cluster work
<ul style="list-style-type: none"> • Predictable and stable framework with respect to economic and political system and IP regulations 	<ul style="list-style-type: none"> • Keep IP regulations
<ul style="list-style-type: none"> • Flexible labor regulations 	<ul style="list-style-type: none"> • Keep standard
<ul style="list-style-type: none"> • Open research and public funding policy 	<ul style="list-style-type: none"> • Increase transparency in funding priority setting process
<ul style="list-style-type: none"> • The “Swiss factor”, e.g., for Swiss quality and risk management, is valued in many countries 	<ul style="list-style-type: none"> • Global communication strategy for “Swiss factor”

Recommendations by study participants — Innovation Policy

Further optimize the educational system

- Education strategy
 - Build education portfolio with focus on competence fields
 - Avoid duplication of research fields at universities
 - Define performance indicators
 - Build Elite Universities (not requested by all interviewees)
 - International exchange programs and technology networks
 - Complementary to Swiss business, diversity of opinions
- More basic engineering and science talents
 - Create incentives for technology studies and careers
 - Start technology programs already in primary schools
 - Securing education more important than Nobel Prizes
 - Emphasis on core science and not on fashion fields
- Request for other academic programs
 - Programs to develop “mavericks”, e.g., in design
 - Financial engineering
- Public-private-partnership
 - Balance IPR ownership between business and academics
 - Enable sabbaticals for academics in the industry
- Marketing and reputation
 - Better market Swiss know how and university excellence on global scale
 - Attract international students to fill gaps without too much loss of knowledge to emerging countries afterwards
- Funding
 - Further incentivize “Private Sponsorships” for university chairs
 - Public investment in “Technology Leadership Programs”

Recommendations by study participants — Innovation Policy

Adjust strategy, marketing and funding to Open Innovation needs

Strategy

- Do NOT interfere in company's Open Innovation activities!
- Active enabler of global activities, e.g., via Swiss Houses, lobbying etc.
- Continue to build on Swiss strengths and reputation, e.g., build and support clusters on private banking, life science etc.
- Support broader regional initiatives like "Greater Zurich Area"

Marketing

- Help regions in Switzerland to become globally known for leadership around cluster-topic, e.g., Basel with life science, Zurich for Financial Service
- Provide frame conditions to attract international high potentials
 - Speed of immigration and communication with public authorities
 - International schools
 - Programs for working mothers
- Attract international investors and start-ups (potential for further economic growth and important for other companies)
 - Keep restrictions to a minimum
 - Promote technology leadership and technology advantages
 - Clarity on policy to facilitate investment decisions

Funding

- Simplify funding programs
- Consider tax incentives or direct funding of R&D programs and investments, e.g., like the 75% public funding of public-private-partnerships in the UK or 50% public funding for investments in Singapore
- SNF and KTI are perceived very positively (e.g., possibility to use funding program also for piloting phase)