

### Chapter 3, Exercise 2 (45 minutes)

Please

- quick-read the paper by Nevzorova, 2022, individually;

#### *Readings for this Chapter:*

Nevzorova, T. (2022). Functional analysis of technological innovation system with inclusion of sectoral and spatial perspectives: The case of the biogas industry in Russia. *Environmental Innovation and Societal Transitions*, 42, 232-250.

<http://dx.doi.org/10.1016/j.eist.2022.01.005>

<https://www.sciencedirect.com/science/article/pii/S2210422422000041?via%3Dihub>

- determine as a group which parts to read in detail to answer the following questions:
  - What is the focal TIS of the Russian biogas industry?
  - What is the sectoral context?
- do the reading in individually;
- answer the questions jointly on half a page and
- **upload the document on Brightspace at the end of the day the latest.**

### Chapter 4, Exercise 1 (40 minutes)

With this exercise you use blended learning and prepare the flipped classroom for Chapter 4.1 and 4.2. Chapter 4.3 is about the cases covered in Exercise 3 of Chapter 4.

Please

- **read Chapter 4 and watch the respective videos (see Reader) individually;**

**Video for 4.1 and 4.2:**

[https://www.youtube.com/watch?v=d58zzI\\_70sg&feature=youtu.be](https://www.youtube.com/watch?v=d58zzI_70sg&feature=youtu.be)

- **quick-read the Readings of Chapter 4 individually;**
- **determine as a group which (parts of) of the papers you need to read in detail to fully understand Chapter 4.**

## 4. Geographical Innovation Systems

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### 4.1 Geographical Delineation of Innovation Systems

The original concept of innovation systems was about national innovation systems (Marx & Brunner, 2013). Nowadays we distinguish innovation systems focusing on technology from innovation systems with a geographical delineation, i.e. regional, national or global innovation systems. Often the focus of technology and geography overlap, e.g. in the case of the software industry in Bangalore (Chaminade & Vang, 2008). Delineating innovation systems geographically can be challenge. Doing so for national innovation systems is rather straight-forward, because you simply take the boundaries of a country to delineate it. There are good reasons for focusing an analysis on a national innovation system, in particular the same or similar formal and informal institutions, culture and language and often long-standing relationships between agents and stakeholders. At the same time innovative agents often relate to others either in units smaller than a country or beyond the national boundaries. Then, it might be more suitable to investigate a regional or global innovation system. Delineating regional innovation systems requires some considerations of how to draw boundaries, e.g. homogeneity or functionality of regions. Often we use what the statistical offices provide as delineations, because this approach makes it possible to underpin our analysis with quantitative data. An often used delineation of regions are the NUTS (Nomenclature of Territorial Units for Statistics) regions (for details refer to Eurostat, 2018). Looking into global innovation systems can be a challenge as the number of potential relationships between innovative agents is immense and the global linkages might be sparse and concentrated. For that reason analyses of global innovation systems are very scarce.

#### *Readings for this Chapter:*

Eurostat (2018): NUTS - Nomenclature of territorial units for statistics

<https://ec.europa.eu/eurostat/web/nuts/background>, last visited 24.08.2022

Marxt, C., & Brunner, C. (2013). Analyzing and improving the national innovation system of highly developed countries — The case of Switzerland. *Technological Forecasting and Social Change*, 80 (6), 1035-1049. <http://dx.doi.org/10.1016/j.techfore.2012.07.008> , particularly Sections 1 and 2.

#### **4.2 Agglomeration and Deglomeration Effects**

Agglomeration and deglomeration relates to economies and diseconomies that are space-related. Generally speaking, economies of scale are cost-advantages. When firms increase their scale of operation the cost per unit of output decreases with increasing scale. Agglomeration effects are space-related economies of scale; deglomeration effects are space-related diseconomies of scale. Agglomeration effects mean that economic and innovative activities in close proximity to each other leads to cost saving. Deglomeration effects mean that spreading economic and innovative activities evenly across geographical space leads to cost savings. Agglomeration and deglomeration effects can take various forms, many of which are crucial to innovation processes and innovation systems, e.g. knowledge infrastructure and human capital.

The existence of agglomeration or deglomeration effects can be a reason to delineate innovation systems one way or the other. To give an example: If employee mobility is central for innovation and research for the technology you analyse and commuting relationships that go well beyond the borders of a city (e.g. the Randstad, the Netherlands, or Greater London and beyond) you might choose a larger area than a city only.

#### **Video for 4.1 and 4.2:**

[https://www.youtube.com/watch?v=d58zzI\\_70sg&feature=youtu.be](https://www.youtube.com/watch?v=d58zzI_70sg&feature=youtu.be)

#### ***Readings for this Chapter:***

Ooms, W., Werker, C., Caniëls, M. C. J., & Van den Bosch, H. (2015). Research orientation and agglomeration: Can every region become a Silicon Valley? *Technovation*, 45-46(November-December), 78-92. <https://doi.org/10.1016/j.technovation.2015.08.001> , particularly Sections 2.2 and 2.3

#### **4.3 Analysing Geographical Innovation Systems**

In the following we cover the case of Bangalore in India, a regional innovation system concentrating on the software industry, and the Swiss national innovation system. Please read the papers carefully to learn how the concepts of Section 4.1 have been used. Based on that you can figure out how to use them for your own assignment.

##### **4.3.1 The Case of Bangalore**

#### ***Readings for this Chapter:***

Chaminade, C. and J. Vang (2008): Globalisation of knowledge production and regional innovation policy: Supporting specialized hubs in the Bangalore software industry, in: *Research Policy*, 37, 1684-1696: <http://dx.doi.org/10.1016/j.respol.2008.08.014>

##### **4.3.2 The Case of Switzerland**

#### ***Readings for this Chapter:***

Marxt, C., & Brunner, C. (2013). Analyzing and improving the national innovation system of highly developed countries — The case of Switzerland. *Technological Forecasting and Social Change*, 80 (6), 1035-1049. <http://dx.doi.org/10.1016/j.techfore.2012.07.008>