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**Thesis:** „PROSPECTS OF CO<sub>2</sub> GEOLOGICAL STORAGE IN THE BALTIC SEDIMENTARY BASIN“

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### Summary of doctoral dissertation

Potential of geological storage of CO<sub>2</sub> has been evaluated in the Baltic sedimentary basin. Information on CO<sub>2</sub> emissions of different countries of the Baltic region is provided. The main part of the dissertation is devoted to CO<sub>2</sub> storage in structural traps in saline aquifers. Only Cambrian reservoir matches basic requirements for structural storage. All potential storage sites are located in Latvian onshore and offshore. Only two large structures were identified in Lithuania, though of rather small capacity in view of annual emissions. The storage in monoclinical structures is an alternative technology. This technology is considered, however, as far (or medium) future approach. The Cambrian reservoir is characterised by very good sealing conditions due to very thick overlying Ordovician–Silurian shaly package. The main risk is related to faults that control most of potential structures. Economic modelling of CO<sub>2</sub> geological storage in Syderiai and Vaškai structures was performed. Application of CO<sub>2</sub> for enhanced oil (and gas) recovery is considered as an additional prospective approach in Cambrian reservoir of Lithuania, Kaliningrad District, and Poland. Very large storage capacity is related to carbonation of ultramafic rocks (serpentinites) of the crystalline basement.. This technology is considered, however, as far future prospect.

### PUBLICATIONS ON DISSERTATION TOPIC BY RASA ŠLIAUPIENĖ

#### ISI Web of Science

1. Šliaupa S., Lojka R., Tasáryová Z., Kolejka V., Hladík V., Kotulová J., Kuchariè L., Fejdi V., Wójcicki A., Tarkowski R., Uliasz-Misiak B., **Šliaupienė R.**, Nulle I., Pomeranceva R., Ivanova O., Shogenova A. and Shogenov K., 2013. CO<sub>2</sub> storage potential of sedimentary basins of Slovakia, the Czech Republic, Poland and Baltic States. *Geological Quarterly*, 57 (2). 219–232. ISSN 1641-7291.
2. Šliaupa, S., Shogenova, A., Shogenov, K., **Šliaupienė, R.**, Zabele, A. and Vaher, R., 2008. Industrial carbon dioxide emissions and potential geological sinks in the Baltic States. *Oil Shale*, 25(4). 465–484. ISSN 0208-189X.

#### ISI Master list

3. **Šliaupienė R.**, Šliaupa S., 2012. Risk factors of CO<sub>2</sub> geological storage in the Baltic sedimentary basin. *Geologija*, 54, 3(79). 100–123. ISSN 1392-110X
4. **Šliaupienė R.**, Šliaupa S., 2011. Prospects for CO<sub>2</sub> geological storage in deep saline aquifers of Lithuania and adjacent territories. *Geologija*. Vilnius, 53, 3(75). 130–142. ISSN 1392-110X.
5. Shogenova A., Šliaupa S., Shogenov K., **Šliaupienė R.**, Pomeranceva R., Vaher R., Uibu M., Kuusik R., 2009. Possibilities for geological storage and mineral trapping of industrial CO<sub>2</sub> emissions in the Baltic region. *Energy Procedia*. Vol. 1, iss. 1. 2753–2760. ISSN 1876-6102
6. Šliaupa S., Satkūnas J., **Šliaupienė R.**, 2005. Anglies dvideginio geologinio laidojimo perspektyvos Lietuvoje. *Geologija*. Nr. 51(3). 19-28. ISSN 1392-110X.

#### **Peer reviewed journals referred in other data bases**

7. Vosylius G., Šliaupienė R., Vikšraitienė J., 2004. Struktūrų vystymasis ir kambro kolektorių facijiniai bei antriniai pakitimai Vakarų Lietuvoje. *Geologija*. Nr. 46(2). 8–16. ISSN 1392-110X
8. Šliaupa S., Katinas V., Vosylius G., Šliaupienė R., Vėjelytė I., 2002. Telšių lūžio paleoįtampų rekonstrukcija Vakarų Lietuvoje. *Geologija*, 38. 12–23. ISSN 1392-110X.
9. Shogenova, A., Šliaupa, S., Šogenov, K., Šliaupienė, R., Pomeranceva, R., Uibu, M., Kuusik, R. (2009): CO<sub>2</sub> geological storage and mineral trapping potential in the Baltic region. *Slovak Geological Magazine*. 5–14. ISSN 1335-096X.

#### **Other peer reviewed journals**

10. Šogenova, A., Šliaupa S., Šogenov K., Vaher, R., Šliaupienė R., 2007. Süsinikudioksiidi industriaalsete emissioonide kaardistamine ja statistiline modelleerimine Balti riikides – CO<sub>2</sub> sidumise ja ustamise esimene etapp... Mudelid ja modelleerimine. [Models and modeling]. Sulemees, Tartu. *Schola Geologica*, III. 45–49. ISSN 1736-3241.

#### **Other journals**

11. Šogenova, A., Šliaupa, S., Šogenov, K., Šliaupienė R., Vaher, R., 2007. Põlevkivi roll CO<sub>2</sub> emissioonis Balti piirkonnas [The role of oil shale in CO<sub>2</sub> emissions in the Baltic region.]. *Estonian Combustible Natural Resources and Wastes*, 1-2. 27–28. ISSN 1736-0315.
12. Šliaupa S., Šliaupienė R., 2013. Klimato kaita ir CO<sub>2</sub> geologinis saugojimas: perspektyvos Lietuvoje. *Energijos erdvė*, 2 (17). 10–16. ISSN 2029-3119.