

Reply to comment by S.F. Þráinsson on “Carbon Capture and Storage: From Global Cycles to Global Solutions” by Oelkers and Gislason, 2023

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Reply to comment

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Our October 2023 *Geochemical Perspectives* article (Oelkers and Gislason, 2023) contained a short section ‘4.7 Money Changes everything’ where we describe how one of the original partners of the CarbFix consortium, Reykjavík Energy first trademarked the CarbFix name under their sole ownership, then created a subsidiary called Carbfix without the consent or prior knowledge of the academic partners.

Reykjavík Energy and the Carbfix Company challenged the above in a critical comment in *Geochemical Perspectives*. Below is our reply. We will address each issue made in the comment one at a time.

- 1. Section 4.7, p. 294: *Sævar Freyr Þráinsson, the CEO of Reykjavík Energy, hereafter called SFP and RE, claims we are incorrect when we stated that much of the funding for the CarbFix project from 2008 to 2019 was obtained by academic partners in collaboration with RE.***

In this case, SFP is mistaken. The EU projects that are referred to in the comment, CarbFix, CarbFix2, and GECO were co-written and co-submitted to the EC by academic partners and Reykjavík Energy. When writing these projects Reykjavík Energy agreed to be the coordinator of the project, and thus received that largest share of the funds from these projects. In addition, numerous academic projects including EU-funded MIR, Min-GRO (MC-RTN-35488), CO₂-REACT (EC Project 317235) coordinated by Oelkers; Nordic fund project 11029-NORDICCS and the Icelandic GEORG geothermal research fund (09-02-001); and the U.S. Department of Energy DE-FE0004847 coordinated by Columbia University funded CarbFix research. The total funding of these academic lead projects was in excess of 10 million Euros. It should also be noted that the current CEO of the Carbfix Company performed her thesis focussed on the CarbFix injections using academic funding. The same is also true for several other current Carbfix employees.

2. Section 4.7, p. 295: *SFP discusses but does not deny that Reykjavik Energy trademarked the CarbFix name and logo for themselves in 2018 on their own without knowledge of the CarbFix academic partners.*

We do not disagree with the facts recalled by SFP in this instance. During our Zurich 2018 meeting we did indeed discuss the need to trademark the CarbFix name and logo as it was becoming increasingly valuable given the success of the project. Edda Sif Aradóttir (ESA) volunteered to take care of this. It was never discussed or agreed between the partners that only one of the partners, that is RE, should be the sole owner of the trademark. The first application for the trademark was registered by RE on its own 6 days later, January 25th, 2018, with the Icelandic Intellectual Property Office with RE as its sole owner. This registration was finalised in March 2018. We were then sent an email from RE on March 28th (Annex 1) with the following text: “Hi everyone. CarbFix is officially a registered trademark now (logo included). Happy Easter”. As clear in this e-mail, no mention is made of the fact that the registration was made in the name of RE only. We were only informed of the ownership of the trademark at the following CarbFix2 partners’ meeting in September 2018 in Reykjavik, Iceland.

SFP continues by implying that sharing ownership of the patent for the CarbFix1 injection method sufficiently honours the original CarbFix consortium agreement. This statement by SFP is in direct contrast to statements made by the Carbfix Company’s CEO, in a memorandum made on November 11th, 2021, in advance of the RE board meeting November 22nd, 2021 (and reproduced in Annex 2). This memorandum states: **the trademark (Carbfix) can be considered the most important asset of the company**, it will have significant impact on its future income, far more than whether the company manages to get patents for the CarbFix methods registered or not.

3. Section 4.7, p. 295: *SFP uses a sentence telling the reader that Edda Sif Aradóttir, the current CEO of Carbfix Company, and hereafter referred to as ESA, was coordinator of the CarbFix EU project grants, to suggest that we have overlooked the work of female researchers.*

This suggestion is groundless. We are fortunate to have worked with many highly talented female scientists over the past 30 years and featured many of their contributions in our *Geochemical Perspectives* issue. Notably, the scientific research contributions of ESA are presented and discussed in detail in Section 4.4.4 pages 263-266. The contributions of numerous of our other female collaborators are highlighted throughout the volume. In total we republished 27 figures from “CarbFix articles” we published with collaborators and where the collaborators were first authors. In total, 14 of the figures were reproduced from articles where a female was first author and 13 of the figures were reproduced from articles where a male was first author.

We acknowledge that we did not describe the management nor the engineering contributions to CarbFix in this volume. This *Geochemical Perspectives* issue is focussed on the scientific development of the carbon cycle and carbon capture and storage. As pointed out by SFP, we

detailed the contributions of CarbFix managers and engineers in a previous publication (Gislason *et al.*, 2018).

- 4. Section 4.7, p. 295: *SFP discusses but does not deny that Reykjavík Energy established a subsidiary with the name Carbfix, fully owned by Reykjavík Energy without our prior knowledge.***

In his comment, SFP is correct that the first announcement by RE was made on November 27th, 2019, which is several days earlier than we stated in the *Geochemical Perspectives* article. That announcement stated that the “board of RE has decided to establish a subsidiary around the carbon storage method of CarbFix, fully owned by RE”. He also mentions and that the company started operating in January 2020.

SFP continues by stating that Siggí presented at a town hall meeting on December 11th, 2019. Siggí presented the broad perspective of “the Global Carbon Cycle and the CarbFix project”. Siggí chose not to publicly address the founding of the subsidiary at that time. This choice was made because he was not able to discuss this issue with RE prior to the presentation as the announcement was made only two weeks prior.

- 5. Section 4.7, p. 295: *SFP discusses what our role was in CarbFix after Reykjavík Energy launched the Carbfix subsidiary, suggesting that our role did not change as a result of their action.***

In our opinions the role of the partners of the CarbFix academic/industrial project changed dramatically once one of the partners trademarked the name of the project and launched a subsidiary. Prior to this time, we were working together in the name of CarbFix to generate solutions to mitigate global carbon emissions. Afterwards, one of the partners owned the name and the logo. This abuse of trust changed completely the dynamics of the partnership. It is worth noting that in the memorandum from the Carbfix CEO of November 11th, 2021, which is reproduced in Annex 2, it is clearly stated that as a result of the registration the Carbfix trademark in Iceland and abroad no one can use or exploit the trademark in any way except those that have been granted permission from the Carbfix Company. Hence, by registration of the trademark, the Carbfix Company could limit any of the original members of the CarbFix consortium to use their expertise or profit from their efforts.

- 6. Section 4.7, p. 295: *SFP discusses but does not deny that the University of Iceland currently holds less than 0.1 percent of the Carbfix Company.***

It should be reemphasised here that the University of Iceland was only allowed to *purchase* a small fraction of the Carbfix Company after Siggí brought up this situation to the Rector of the University. It is also worth noting that neither we nor any of the academic partners of the CarbFix consortium have ever received remuneration to date from this project.

7. Section 4.7, p. 295: *SFP suggests that the statement ‘The naming of the company Carbfix was likely intentional to give the impression that the company generated the technology on their own from the beginning’ is an unfounded innuendo.*

First it should be noted that this statement does not appear in the final printed nor in the final on-line version of the *Geochemical Perspectives* issue. This statement in the final version of the manuscript reads ‘*The naming of the company Carbfix gives the impression that the company generated the technology on their own from the beginning*’. Second, although *SFP* suggests here that using the name Carbfix for their subsidiary was not chosen to give the impression they generated the CarbFix technology, naming the company Carbfix most certainly does give this impression. This is further underscored by the fact that the Carbfix Company recently trademarked the phrase ‘**Carbfix, turning CO₂ into stone since 2012**’¹ despite the fact that the Carbfix Company only started operating in January 2020.

8. Section 4.7, p. 296: *SFP rejects our statement that academics should be wary of the behaviour of private sector partners once significant profit may be involved and accused us of inaccuracies, misrepresentations and a long list of factual errors.*

These accusations are without evidence. Truth and honesty are the basis of science hence, these accusations are an attack on the credibility of both our work and our careers. Such accusations are inappropriate and unprofessional. Here we have shown that these accusations by *SFP* and *RE* are unfounded.

Despite the tension this has caused, we remain confident that telling the facts and details of the events during 2018 to 2021 once it became apparent that carbon removal via subsurface mineralisation could be a highly profitable business, is essential for our community. The private business sector plays by very different rules than the academic community, and our scientific community needs to be made aware of this.

References

- Gíslason, S.R., Sigurðardóttir, H., Aradóttir, E.S., Oelkers, E.H. (2018) A brief history of CarbFix: Challenges and victories of the project’s pilot phase. *Energy Procedia* 146, 103-114.
- Oelkers, E.H., Gíslason, S.R. (2023) Carbon Capture and Storage: From Global Cycles to Global Solutions. *Geochemical Perspectives* 12, 179-349.

¹ <https://www.carbfix.com/purpose> and <https://www.hugverk.is/leit/voerumerki?textfield=carbfix>

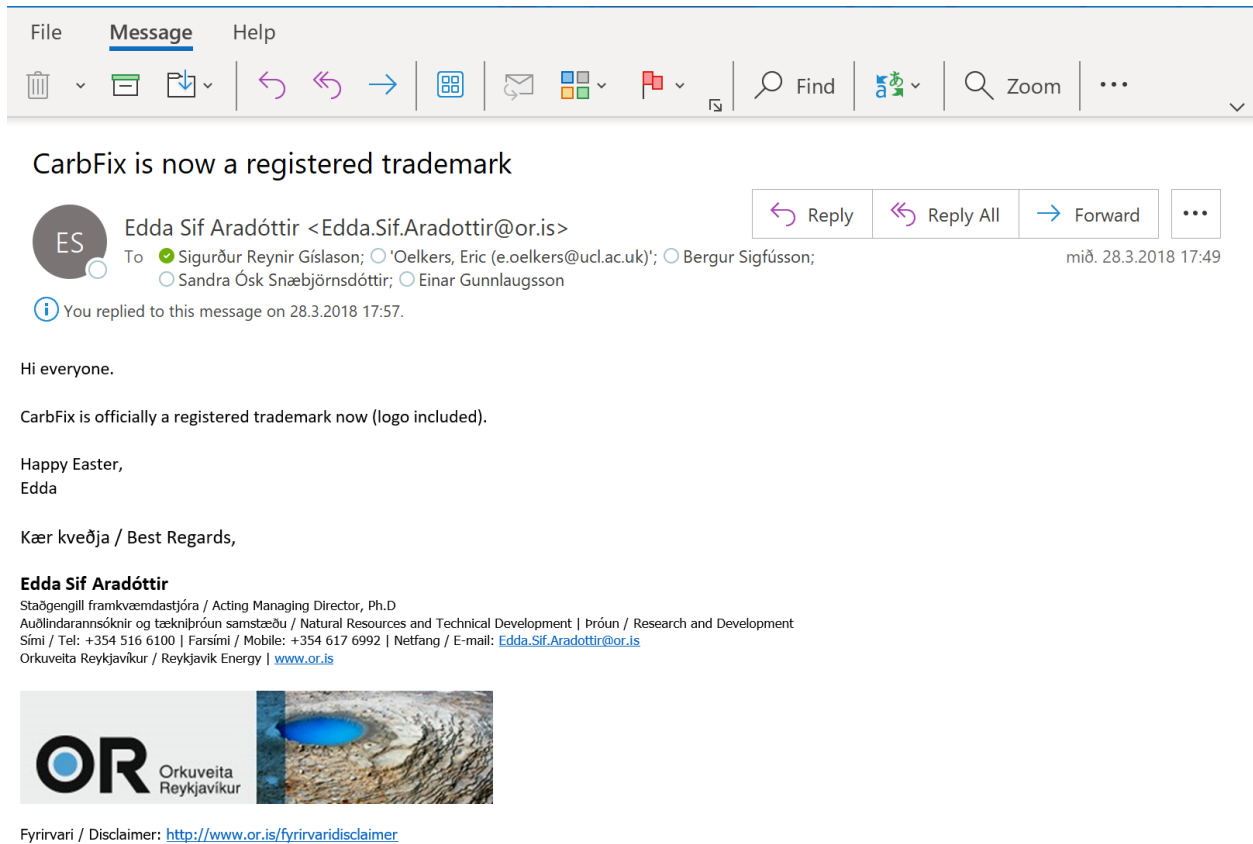
Additional information

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Editors: Mihály Pósfai, Sarah Gleeson, Richard Pancost

Annex

Annex 1. CarbFix is now a registered trademark. Email by RE on March 28th, 2018.



The screenshot shows an email client interface with a menu bar (File, Message, Help) and a toolbar with icons for trash, folders, undo, redo, print, mail, calendar, and search. The email content is as follows:

CarbFix is now a registered trademark

Edda Sif Aradóttir <Edda.Sif.Araddottir@or.is> mið. 28.3.2018 17:49

To: Sigurður Reynir Gíslason; 'Oelkers, Eric (e.oelkers@ucl.ac.uk)'; Bergur Sigfússon; Sandra Ósk Snæbjörnsdóttir; Einar Gunnlaugsson

You replied to this message on 28.3.2018 17:57.


Hi everyone.

CarbFix is officially a registered trademark now (logo included).

Happy Easter,
Edda

Kær kveðja / Best Regards,

Edda Sif Aradóttir
Staðgengill framkvæmdastjóra / Acting Managing Director, Ph.D
Auðlindarannsóknir og tæknifróun samstæðu / Natural Resources and Technical Development | Þróun / Research and Development
Sími / Tel: +354 516 6100 | Farsími / Mobile: +354 617 6992 | Netfang / E-mail: Edda.Sif.Araddottir@or.is
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Fyrirvari / Disclaimer: <http://www.or.is/fyrirvaridisclaimer>

Annex 2. Meeting minutes from the RE board meeting November 22nd, 2021 (thereafter), and Carbfix Company CEO's memorandum November 11th, 2021, on page 10 of the documents available at https://www-new.or.is/documents/1170/Fundur_312_22.11._2021_me%C3%B0_fylgiskj%C3%B6lum.pdf

MINNISBLAÐ

Víðtakandi: Stjórn Orkuveitu Reykjavíkur

Sendandi: Edda Sif Aradóttir, framkvæmdastýra Carbfix ohf.

Dagsetning: 11. nóvember 2021

Efni: Carbfix og áhrif þess hvort einkaleyfi fæst samþykkt

Óskað hefur verið eftir upplýsingum um það hvaða áhrif það kann að hafa á framtíðarstarfsemi Carbfix ohf. og væntanlegs Carbfix hf. ef þau einkaleyfi, sem sótt hefur verið um, fást ekki.

Fyrst er rétt að rekja ástæðu þess að ákveðið var að ráðast í að sækja um einkaleyfi:

Snemma árs 2018 var haldið málþing hér á landi um hugverkarétt jarðvarmageirans á Íslandi til að vekja athygli á mikilvægi þekkingar og hugvits fyrir samkeppnishæfni geirans. Greiningar höfuð leit í ljós að töluverð aukning var í umsóknum um einkaleyfi í jarðvarma innan Evrópu (og þ.m.t. á Íslandi) en að engar umsóknanna kæmu frá Íslandi þrátt fyrir að ljóst væri að í grunninn væri stór hluti hugverka í jarðvarmaíðnaði þróaður hér á landi. Þá væri sérstakt áhyggjuefni að kínverskir aðilar væru í auknum mæli að sækja um einkaleyfi í jarðvarma innan Evrópu.

Brá ýmsum við þær fréttir enda ljóst að einkaleyfi á sviði jarðvarma innan Evrópu gætu hamlað frelsi til athafna hér á landi. Í kjölfarið var ákveðið að endurvekja fyrri einkaleyfaumsóknir tengdar Carbfix a og voru tvær umsóknir sendar í evrópskt og síðar alþjóðlegt einkaleyfaferli. Annarsvegar var um að ræða einkaleyfaumsókn vegna niðurdælingatækni Carbfix en hins vegar hreinsistöðvar á sem fangar CO₂ og H₂S úr útblæstri jarðvarmavirkjunar. Markmiðið með umsóknunum var ekki síst til að tryggja frelsi til athafna en jafnframt að aðrir aðilar gætu ekki sótt um leyfi fyrir þeim aðferðum, sem þróaðar hafa verið innan samstæðunnar. Með því að sækja um einkaleyfin var s.s. komið í veg fyrir að aðrir gætu sótt um einkaleyfi vegna sömu aðferða.

Einnig var vörumerki Carbfix skráð héraðs og erlendis og þar með komið í veg fyrir að aðrir en þeir sem til þess hafa sérstakt leyfi, geti notfært sér það, eða auðkennt sig á neinn hátt með því að verið sé að nota Carbfix aðferðina, nema með leyfi Carbfix, sem eiganda og réttahafa vörumerkisins.

Enn er ekki ljóst hvort að önnur, báðar eða hvorug fyrirliggjandi umsókna um einkaleyfi fást skráð. Það mun hins vegar ekki skipta sköpum fyrir starfsemi, þróun eða framgang Carbfix. Nú þegar er verið að innheimta þóknun fyrir nýtingu aðferðarinnar, þrátt fyrir að einkaleyfi liggi ekki fyrir, og mun þeirri innheimtu verða fram haldið, hvernig sem niðurstöður verða varðandi skráningu einkaleyfa.

Tekjur Carbfix munu í framtíðinni fyrst og fremst vera af tvennum toga; annars vegar vegna sölu á ráðgjöf um nýtingu og uppbyggingu aðferðarinnar, en hins vegar af innheimtu þóknana (e. royalties) vegna nýtingar aðferðarinnar. Það mun væntanlega ekki hafa nein áhrif á tekjur af sölu ráðgjafar hvort einkaleyfi fæst eða ekki, en hugsanlegt er að fjárhæð þóknana verði eitthvað lægri en ella, ef ekki fæst einkaleyfi, þar sem vera kann að hægt verði að verðleggja einkaleyfisvermdaða aðferð hærra en ella. Það er þó mat Carbfix að það muni alls ekki skipta sköpum um framtíðartekjuöflun félagsins. Að auki er verið að undirbúa a.m.k. þrjár nýjar einkaleyfaumsóknir sem tengjast frekari þróun á tækni Carbfix og ljóst að fjöldi umsókna mun verða meiri samhliða áframhaldandi nýsköpun á vegum félagsins.

Rétt að geta þess að aðrir aðilar en Carbfix hafa verið að selja ráðgjöf um aðferðina og munu væntanlega halda því áfram, þó þannig að auðveldara væri að gera athugasemdir við slíka ráðgjöf ef um skráð einkaleyfi væri að ræða.

Rétt er að leggja áherslu á að vörumerki Carbfix hefur styrkst mikið að undanförmu og virðist orðið nokkuð þekkt alþjóðlega eftir afar mikla umfjöllun erlendra fjölmiðla, ekki síst í tengslum við COP26. Þess ber þá að geta að ekki hafa farið fram formlegar vörumerkjakannanir í þessu samhengi. Telja verður vörumerkið mikilvægustu eign félagsins og að það muni hafa veruleg áhrif á framtíðartekjur þess. Mun meiri en það hvort einkaleyfi fyrir Carbfix aðferðum fást skráð eða ekki.