SPEECH AT THE CLOSING CEREMONY OF THE 40TH ANNUAL SESSION OF THE UNU GEOTHERMAL TRAINING PROGRAMME.

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Your Excellency Permanent Secretary of State, *Mr. Sturla Sigurjónsson,* Director General, *Mr. Ingvi Már Pálsson,* Ministry of Industries and Innovation, distinguished guests and UNU Fellows.

This year is a special year for the UNU Geothermal Training Programme – as we are celebrating our 40th anniversary, having been formally established at the end of 1978. This is also the 40th class since the programme started operation in the spring of 1979. We celebrated this in April at the Iceland Geothermal Conference – IGC2018, with a special anniversary workshop. There we enjoyed the company of the Minister for Tourism, Industry and Innovation Mrs. Þórdís Kolbrún Gylfadóttir, who addressed the numerous attendees who were there to celebrate this occasion with us. After her address presentations on the status of the programme were given by staff members and 5 high level foreign guests, all former UNU Fellows, who were invited specially to Iceland for the 40th anniversary. During the second half of the workshop our PhD and MSc UNU fellows presented the results of their research projects on geothermal which they have been working on as a part of their academic studies in Iceland. It was a memorable day for the UNU Geothermal Training Programme, and not least for the excellent presentations of our UNU fellows. And I can add, that I have rarely been as proud to be the director of this wonderful and successful programme. I believe it is rare, globally, that a programme of this type has reached a similar status and age. This in itself is also a strong indication of the need and importance of the programme.

In capacity building terms the year 2018 was not quite as hectic as some of the recent years, but in our key sectors, *the 6-Month Training, the Academic Studies and the Annual Short Course Series* we have experienced strong activity and even growth, but less so with *the Customer-Designed Courses and Training.*

This year 24 UNU Fellows were invited to Iceland for the 6-month training, and all are graduating today, even though one of them is missing from the group present, for special reasons. Five of eight study lines were operated, and for the first time it was the study line of *Geothermal Project Management and Finances*, which attracted the highest number of candidates, 7 in all. The UNU Fellows come from 14 countries on 3 continents, and, as in recent years, the highest number from a single country was from Kenya, **five** in total. Geothermal development in Kenya continues in a fast-tracking mode, with almost 700 MWe on-line, and several power plants in the planning or building stage. If the power plant at Theistareykir had not come on line, Kenya would have surpassed Iceland, and probably for good. But that is anyway due to happen soon, which the UNU-GTP will welcome, as it is very much a prove of the success of the programme. The majority of the Kenyan UNU fellowships were financed by KenGen in Kenya, or agencies supporting it, in addition one UNU fellowship was financed by Sinopec Green Energy Geothermal Development Co. in China. For the second year running we had no participation from Europe, where the EEA-funds had been strong in the years before that, financing several UNU fellowships for Hungary, Portugal and Romania. I hope to see this possibility open up again in a year or two with EEAs' new financial period.

With this group, 694 scientists and engineers from 61 developing countries have completed the 6-month training at UNU-GTP. Iceland has certainly found a good number of fine ambassadors amongst these. Our new country this year is St. Lucia in the Caribbean, an island with a lot of potential for geothermal energy. The highest number of candidates has certainly come from Kenya, now with 129, with China in 2nd place with 89 candidates.

During 2018, 16 UNU fellows were doing MSc studies in Iceland, 9 of them under our longstanding agreement with University of Iceland, and seven under the more recent agreement with Reykjavik University. Two of these graduated from RU in the spring and four have graduated from University of Iceland this summer, the last one actually earlier this week. They come from Djibouti (1), Indonesia (1), Kenya (2), St. Vincent and the Grenadines (1) and Yemen (1). With this, 62 UNU fellows have graduated with an MSc degree in Iceland on a UNU-GTP fellowship, a number I am proud of.

Four UNU Fellows are carrying out their PhD studies in Iceland on a UNU-GTP fellowship, 3 from Kenya and 1 from China. In addition, two Kenyan women have, in recent years, completed a PhD

degree on a UNU-GTP Fellowship in Iceland.

Gender equality is important to the Geothermal Training Programme and for Icelandic foreign policy. The difficulty for UNU-GTP is that in many developing countries, which sorely need assistance with capacity building for geothermal development, energy business and energy research are not attractive work for women, or perhaps they are just not given fair opportunities. I am fairly pleased with the balance in 2018, which saw 9 women among the 6-month UNU fellows or 38% of the group. To that we can add 7 of 16 MSc fellows, who were women, and 1 of four PhD fellows. I think in all, this is a better balance than we have seen before. And I can assure the Permanent Secretary that we will certainly do our best to continue improving on this – to reach full gender equality which is of course our ultimate goal.

Our annual Short Course Series in Kenya for East Africa and in El Salvador for Latin America and the Caribbean were reorganized in 2016 in order to support better the ideas set forward with the UN SDGs. Last month saw the 3rd event in our LAC-series given in El Salvador, with 76 participants, which is a record for any such event. Regarding our E-African series hosted by Kenya through longstanding cooperation with KenGen and the Geothermal Development Company - GDC, there are though unexpected clouds on the horizon, as only two days ago we received a formal letter from GDC, that they are withdrawing from this cooperation after 9-year commitment. Despite this very late action of GDC, only 5 weeks before the start of next event, we are optimistic that we will be able to continue along this road, through our very strong cooperation with KenGen, but probably in a somewhat reduced capacity. Together with KenGen we are working on modified plans which we hope to have ready in the next few days, which could see 35-40 participants for a short course lasting about 15-20 days.

The customer-designed courses and training have been very important in our operations in recent years. This year has seen more modest activities. Now, we are though preparing two 2-day Short Courses to be held in association with ARGeo-C7 conference in Kigali at the end of this month. Both Short Courses are sponsored by the ICEIDA department of MFA.

Our annual UNU Visiting Lecturer for 2018 was the American geophysicist William Cumming, who gave a series of excellent lectures on the application of geophysical methods in geothermal exploration and associated problems. Here, his discussion on pitfalls and constrains related to geophysical data and how this can affect decision-making was especially interesting. His lectures were very well received and attended.

This year saw also the third year of our cooperation with LaGeo of El Salvador on running of the Diploma Course given at the University of El Salvador intended for Spanish speaking geothermal experts, with 30 geothermalists from Latin America attending the course. Our SDG Short Course Series are an integral part of the Diploma Course and Icelandic lecturers are participating in the teaching. The Nordic Development Fund has supported the course for these first 3 years of our direct involvement, through the ICEIDA department of the MFA and some additional funding has also come from there, with UNU-GTP responsible for the implementation together with LaGeo. Discussions are now ongoing on the continuation of this financial support, possibly for the next five years. We are optimistic on positive results in that.

During the 40 years of the operations of the Geothermal Training Programme, I can whole-heartedly state that we have had good support from the Government of Iceland, which has ensured the strength of the programme despite difficult economic climate in some not so distant years. The budget from the government is the basis of our activities. After having suffered some cuts in our budget since 2014, it was good see improvement in this again, to allow us to continue along the same road.

Still there are additional requests for capacity building in geothermal – which we have not been able to satisfy in the past. This has, however, had a positive side for us, through the requests for training or short courses with available external funds to finance it. This has helped us to keep our flag flying as high as ever. In 2017, this amounted to about 17-18% of our total income and I expect a similar balance this year. This is very important for us. Still I want to re-emphasize that the contribution from the Government is our basis and we must have a solid basis, to plan ahead.

Here, I would also like to thank the many teachers, trainers and supervisors, who we have been able to call upon during the year. You are the key to the success of the Geothermal Training Programme. It is really unbelievable how firmly the whole geothermal industry in Iceland stands behind us and supports us when needed. The experts of ÍSOR – Iceland GeoSurvey have as before carried the biggest load with about 50% share, while about 15% have come from the Universities, and 35% are specialists from consulting engineering offices, energy utilities and other companies and institutions. As important is the proximity the UNU Fellows can have with the teachers, to have access to them almost any time of the day if needed, or just to be able mingle so freely and being so welcomed by the Icelandic geothermal industry,

or the whole Icelandic society. This is an eye-opener to most of them. In all, close to 100 teachers contributed to the teaching, training and supervision at UNU-GTP this year, which certainly makes the UNU-GTP a large working place despite only 5 permanent employees. With that I want to bring the attention to the staff – Ingimar, Markús, Málfríður and Þórhildur, my deepest thanks for your dedicated work. Your drive and will in work is so important for the success of the programme, in academic terms but as importantly in human terms.

After this review of our activities in 2017, it is time for me to turn my attention to the current UNU Fellows. Our class of 2018 is a good class – I can state that and stand by it. I am also sure that through your training you – the UNU Fellows – are clear on the importance of geothermal development for your home country. You were selected to come to Iceland because we believed in you having the potential to contribute to a greener future in your home country and for our world – and now it is your task to deliver – to help with the lighting or heating of the homes in your country with geothermal energy.

During your time in Iceland, you learned about and experienced some of the benefits of geothermal energy. I hope that this will be a driving factor in your work in the near future. This was the reason for your coming to Iceland. However, you also experienced other things. For us Icelanders, the summer of 2018 will primarily be remembered for the record rains we got – from late April into late July, when we had rain almost every single day here in Reykjavik. Fortunately, the summer had a late twist, with reasonably good weather for the second half of your stay – at least Icelandic standards. Those of you with interest in sports, witnessed the end of the second chapter of our *Icelandic Football Adventure*. Living to see Iceland reach the World Cup finals in Russia was something I had hoped for and worked hard for, but not really expected to live and experience. And even though our team did not do quite as well as I had hoped for, it was still an unbelievable adventure to remember. I will cherish my two weeks in Russia for a long time. And we cannot forget, that with this tournament Iceland became by far the smallest nation to have played at this biggest stage in international sports. This was a real spice on your stay here.

A goal for you to aim at is to come back to Iceland in 2020 for the next World Geothermal Congress held here in April 2020. For that you need to send in an abstract by January and then a full paper later in 2019. And I can inform you that, UNU-GTP will be offering Fellowships to former UNU fellows for partial support to come to Iceland for the Congress. I look forward to see many good papers from you to be a part of this.

Dear UNU fellows, in only a few days, you will be returning to your home. There you are expected by your families and friends who will cherish your home-coming after such a long stay away from home. You must be longing for this reunion, after your sacrifices. When you return home, please remember to keep in touch with us and your fellow trainees. In our age of information none of us has the excuse of not being able to connect. And you must also remember your new families, which will be a part of your future live. The UNU Geothermal Family keeps on growing every year, now with 694 members, and the same applies also to the Big Geothermal Family, where development of geothermal resources is the burning ambition. As with other family ties, this means both duties and pleasures. We will be following you from distance and supporting you in work as possible.

I wish all of you a very good and safe journey home, and I look forward to see you soon again, wherever that may be.

THANK YOU