

EDITOR'S PAGE

NEW RISE IN THE OIL SHALE R&D

It is obvious that the world's ever increasing demand for liquid fuels and chemical products, on the one hand, and the predicted exhaustion of traditional crude oil resources in about forty years, on the other, have created a need for more extensive exploitation of other energy resources and raw materials for chemical industry even today. In the search of future sources enabling to work out economically grounded new technological solutions in power engineering, one may decide to use, beside heavy oils and solid fuels (whose utilization has been restricted due to their costly excavation and processing) and gaseous fuels, also inexhaustible and restorable energy resources such as wind, the sun, and biomass. However, it is hard to imagine that the mankind will be able to meet the ever growing needs for various chemical products without utilizing fossil fuels as a major resource for a long time yet.

Oil shale is beside coal a major resource for power engineering and chemical industry. According to the World Congress on Power Engineering, oil supplies of world's oil shale deposits are 550 billion tonnes.

In Estonia oil shale has been mined since 1916, for 85 years already. This year marks one more jubilee anniversary – the first Estonian oil shale retorting unit, a vertical retort with the daily throughput rate 7–8 tonnes of oil shale, was put into operation in Kohtla-Järve 80 years ago. Since then hundreds of scientists all over the world have studied various local oil shales and the possibilities of their utilization. Different technologies of mining, power engineering, and production of liquid fuels, all kinds of building materials and chemical products have been worked out. In Estonia several retorting units such as vertical retorts, Davidson horizontal rotary retorts, tunnel ovens, chamber ovens, horizontal rotary retorts with solid heat carrier have been in use within those years. Innumerable scientific investigations and applied studies on the chemical composition of oil shale and shale oil, and on the technologies for production of prospective chemicals have been carried out.



The Institute of Oil Shale Research at Tallinn Technical University for one has studied more than 36 oil shale samples from various deposits all over the world, both in laboratory and under pilot-scale conditions.

Estonian oil shale processing enterprises have played and still play an important role in the field of investigation and utilization of world's oil shales. In spite of drastic drops of prices of crude oil and its products occurring periodically in the world market, Estonian oil shale industry has succeeded in survival and development. The processes of oil shale thermal processing employed in Estonia today – *KIVITER* for processing oil shale lumps in retorts with daily throughput rate up to 1000 tonnes of shale, and *GALOTER* for processing shale fines in units with daily throughput rates 3,000 tonnes of shale – meet the present requirements of the best available technologies.

Developing economy, especially considering Estonia's possible alignment with the European Union in the nearest future, imposes on industry more and more strict requirements in environmental policy, thus compelling us to make ever more serious efforts to improve the existing technologies in order to guarantee sustainable development of the industry considering at the same time the efficiency of production, sustainability of natural resources and the environment, and stabilization of the social life. Among the tasks oil shale industry is facing today, possible balancing of technology transfer risks and the application rate of the new technologies have become the top priority.

Scientific institutions and laboratories which have been carrying out research and development work separately so far started with co-ordinated activities last year. Estonian laboratories and research teams dealing with oil shale studies have mostly been assembled as institutes and departments of Tallinn Technical University. Some research groups work at Tartu University and Tallinn Pedagogical University. The Government and the Estonian Academy of Sciences have appointed the Institute of Oil Shale Research at Tallinn Technical University to be the institution co-ordinating scientific and applied research. It includes a number of research laboratories and participates in the teaching process both in Tallinn and at Kohtla-Järve. Close co-operation with enterprises of oil shale industry at Kohtla-Järve enables a more effective application of the results of scientific investigations. Within the framework of a regional development project *The Centre of Oil Shale Research* will be established at Kohtla-Järve in 2001–2002 on the basis of the Institute of Oil Shale Research at Tallinn Technical University.

The recent years have witnessed a worldwide rapidly growing interest in oil shale, and there is an increasing international co-operation developing on this basis as attested by the program *US – Estonia Science and Technology Co-operation on Oil Shale Research and Utilization* successfully launched last year. Scientists and engineers of numerous other oil shale countries such as Canada, Australia, Russia, China, Israel, and Jordan have intensified oil

shale research. Oil shale industry is developing in new directions searching ways to give a new additional value to the products and to intensify the processes considering at the same time the restrictions of ecologically benign economy. An interest in elaboration and application of new technologies of oil shale processing and its burning for power generation has grown among both private and state enterprises. During intensive research on oil shale as a substitute for petroleum, US have spent more than 3.4 billion dollars including about 400 million dollars by the Federal Government funds. In 1978–2000 oil shale research has been continuously financed by the US Ministry of Power Engineering. We hope that the planned doubling of financing scientific research and practical activities by the Estonian state budget in the nearest future will involve studies on oil shale as well.

There has arisen an urgent need for elaboration of a strategy for developing oil shale industry, and not only on the local scale. The expanding exploitation of oil shales favours also sustainable utilization of crude oil resources. Further widening of international co-operation in the field of oil shale studies is of the utmost importance.

Today oil shale researchers and specialists are expected not only to intensify basic and applied research and seek scientific and technical solutions, but to analyze thoroughly the existing scientific data and applied technologies as well in order to disclose the chemical and power potential of oil shales more fully. As mentioned above, there are results accumulated by efforts of several generations of scientists and engineers and requiring, first, systematic thorough study and treatment corresponding to the modern possibilities and needs of information exchange to make them available for all people concerned with this field, and, second, evaluation of the existing knowledge on oil shales. This is a gigantic job. At the same time it is impossible to underestimate the importance of this work for economic efficiency and effectiveness of further investigations and practical activities, and for modelling further strategy of the development of oil shale industry.

Information exchange between world's oil shale researchers themselves and between interdisciplinary scientists, and regular personal contacts have become of great importance. It is time to arrange an international conference to interchange scientific and practical knowledge on oil shale.

With the aid of our authors *OIL SHALE* has long been doing a thank-worthy job by collecting information on oil shale all over the world and mediating its interchange, and thus could be of great help both in accumulating and systemizing the existing information, and in organizing international scientific meetings. I should like to take the opportunity to greet all our readers and authors and to ask them to express their opinions of the need for convocation of such a meeting.

The symposium might take place in Tallinn in autumn 2002, and it should become the beginning of regular – maybe biannual – interchange of experience between oil shale researchers and engineers. It might be of inter-

est to sum up the development of oil shale science and industry in 2004, on the 80th anniversary of launching the first Estonian commercial-scale retorting unit. Most likely we shall then be able to attest to a rapid development of oil shale research and applications and to discuss the practical results of these activities.

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