Table 1. Ion currents [eμA] available from the new ECR ion source.

Ion/charge	+1	+2	+4	+6	+8	+9	+11	+14	+20	+25	+26	+27	+30	+31	+32
H	2000														
He	2000	1000													
C	500	350	200	3											
N	1000	300	100	10											
O	1000	400	300	200											
Ne	1000	300	200	160	25										
Ar	1000	350	250	200	200	90	30	1							
Kr	1000						25	15							
Ag			250	250	200	90	30		4						
Xe	500				220				3						
Ta									4	0.8					
Au											10	6	1	0.7	0.2
Pb									10	5	3	1			

8. The Warsaw PET Project – Radiopharmaceuticals Production Centre

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The information on the Warsaw Consortium for PET Collaboration (WCPC), the Warsaw PET Project and its Radiopharmaceuticals Production Centre (RPC) was already presented in previous Annual Reports of HIL [1,2]. During 2007 a substantial progress in the administrative, legal and financial preparation of RPC realization in the HIL building was achieved.

In 2007 we have finalized long negotiations with International Atomic Energy Agency (IAEA), related to the building adaptation contract. The Amendment 2 to our Collaboration Agreement settling the encountered problems was signed on 5 September.

Last year our activity also resulted in a substantial increase of funds available for the RPC equipment purchase. In July the subvention for the acquirement of the Quality Control units was allocated to the Laboratory by the Ministry of Health. One month later the Warsaw University signed a contract with the Ministry of Science and Higher Education allowing us, using European funds, to buy a supplementary equipment for the production of radiopharmaceuticals used in the research programme.

Finally, on 23 October two contracts for the realization of a turnkey project were signed in the Agency offices by the Rector of the Warsaw University between

a) Warsaw University and GE Healthcare Company for the building adaptation;
b) Warsaw University, IAEA and GE Healthcare Company for the supply of the equipment (including the 16.5 MeV proton cyclotron).

After the contract signature the Contractor and its Subcontractors prepared and discussed with Laboratory representatives the layout of the RPC, including the calculation and design of the cyclotron protection walls. Recently (19-22 February 2008) the preliminary version

of this layout has been reviewed and substantially modified after discussions with the Agency experts (the visit of two experts was arranged and financed by IAEA using funds for Technical Cooperation between Agency and Poland, within our PET project).

It is expected that the building adaptation design will be ready by the end of April 2008 and the construction permit will be obtained two months later. The Contractor plans to finalize the whole project during the first trimester of 2009. The regular production of the most popular radiopharmaceutical, fluorodeoxyglucose (FDG) will, however, be only possible after its registration. This may take up to one year.

References:

[1] J. Jastrzębski *et al.*, HIL Annual Report 2006
[2] http://www.slcj.uw.edu.pl/PET

9. Nuclear-coal synergy project

L. Pieńkowski for the Nuclear-Coal Synergy consortium

The goal of the nuclear-coal synergy project is to develop and demonstrate the technologies that can efficiently use the nuclear hydrogen and oxygen to reduce CO_2 emission (clean coal technologies, CCT), and for coal to liquid fuels conversion (CTL) without CO_2 emission. Nuclear hydrogen production is a CO_2 emission free technology driven by high temperature reactors (HTR), i.e. by the nuclear process heat and/or by electricity that split water molecules. This project requires common European efforts and should be formulated as European programme concentrated in Poland.

The idea of the Polish nuclear-coal synergy project originated in the Heavy Ion Laboratory. The following parties declared their interest in joining the Consortium established on 28 June 2006:

- AGH University of Science and Technology,
- The Andrzej Sołtan Institute for Nuclear Studies,
- Central Mining Institute, Katowice,
- Częstochowa University of Technology,
- Institute of Atomic Energy,
- Institute for Chemical Processing of Coal, Zabrze,
- Institute of Nuclear Physics, Polish Academy of Sciences,
- Institute of Nuclear Chemistry and Technology,
- Silesian University of Technology at Gliwice,
- University of Silesia,
- Warsaw University,
- Warsaw University of Technology,
- Wrocław University of Technology,
- Institute of Chemical Engineering, Polish Academy of Sciences, Gliwice.

AGH University of Science and Technology is the leading institution of the project and is represented by Professor Kazimierz Jeleń, Deputy Rector of AGH. Ludwik Pieńkowski, from the Heavy Ion Laboratory and Jerzy Cetnar, from AGH are coordinators of the project.

This challenging project is included in the frame of the strategic programme of the Council for Atomic Energy Matters [1], aiming at increasing the role of nuclear research in Poland.