

Evaluation report

Evaluated point	Grade	Comments
Scientific impact of research	Satisfactory	<p>AS Metrosert, Estonia's calibration and verification laboratory, has been representing Estonia in the European Association of National Metrology Institutes (EURAMET e.V) since 2004. In this role, they have developed three European research programmes and have a permanent position in the Executive Committees in those programmes run by EURAMET e.V.</p> <p>EURAMET are coordinating metrological activity across Europe and are responsible for developing calibration and technical guides for measurements techniques and methods. With EURAMET's vision to ensure Europe's world-leading metrology capability, high-quality scientific research is essential. Against this background, and with the need for development of reliable measurement methods, the R&D Division was formed in the company (hereinafter Metrosert). Through their R&D team, Metrosert have been involved with both the European Metrology Research Programme (EMRP, 2007-2013) and the follow-up European Metrology Programme for Innovation and Research (EMPIR, 2014-2020). In the latter Metrosert have participated in 13 research projects. More recently, they are involved with the new EMPIR for 2021-2027.</p> <p>Metrosert are involved with three European Metrology Networks: Quantum Technologies, Smart Electricity Grids, Smart Specialisation in Northern Europe, and joining a 4th network for Traceability in Laboratory Medicine in 2021, which indicates their standing in the field.</p> <p>Their research activity falls within three thematic areas: (i) metrological support for industry/production and digitalisation in industry, (ii) increasing efficiency in use of resources (power consumption), and (iii) fundamentals in measurement science for quantum metrology and secure telecommunication.</p> <p>In terms of outputs, Metrosert have participated in 10 EURAMET Technical Committees for different measurement fields and activities. In Estonia, they updated the national standards for dimensional quantities, electrical quantities and temperature, and established 4 reference measurement standards.</p> <p>Traditional academic publication output of the evaluating institution, however, has been declining. Although statistics cannot be used due to the small group, it is nevertheless noticeable that from 4 high-level publications in 2015 (or 4.44 /FTE) there was only 1 (or 0.48 / FTE) in 2019, with 12 outputs in total. To enhance such academic outputs, closer collaboration with universities and involvement with supervision of PhDs should be sought.</p>

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Sustainability and potential of research	Satisfactory	<p>Metrosert was established in 1992 and is the Estonian Central Office of Metrology in charge of calibration and verification. The company, whose shares are 100% belonging to the Estonian government, is therefore very sustainable. Metrosert is currently dedicating 20% of their budget to R&D which is promising. The current staff involved in R&D is 6 persons (3,3 FTE) out of which 3 hold a doctoral degree. There are plans to recruit two additional persons in the next months and it is very important for Metrosert to recruit at PhD level to increase their research capabilities. On staffing the lack of female researchers was noticeable.</p> <p>Metrosert is member of EURAMET network which offers them many opportunities for international cooperation. So far, Metrosert has been part of several projects with small budget, but is currently revising its strategy to participate to a smaller number of projects with larger budget which is appropriate. Currently, the revenues generated by domestic or international contracts or grants are modest, 81 k€ and 65 k€ on average per year respectively. Investment costs for lab equipment are high, and could hardly be covered by the current R&D revenues. During the online interviews, the review panel could appreciate many research potential avenues for Metrosert related to medical applications e.g. in-vitro measurements in human body, biochemistry, smart electrical grids, optics and quantum photonics, or, even, robotics and AI. The fast digitalisation of the society means new opportunities for Metrosert. There is clear potential for research but to make it sustainable, the review panel recommends:</p> <ul style="list-style-type: none"> • To elaborate a research strategy defining Metrosert mission and objectives in terms of R&D. • To ensure a clear hiring plan attracting and retaining highly qualified personnel at PhD level, also to cover new fields of application for metrology. Initiatives to address gender balance of staff should also be introduced. • To expand the research laboratory facilities. • To develop the collaboration with academic partners both domestically and internationally. • To support the researchers in their application for domestic and international grants or contracts and increase the corresponding revenues.
Societal importance of research	Good	<p>Metrology and new measurement techniques are crucial to make future technology available. Metrosert then has a national key role, e.g. in the Estonian ICT cluster to support innovation of the digital society. This Cluster is a collaboration platform for enterprises, created to boost the development of new products and solutions and foster their export to the international market.</p>

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		<p>Metrosert R&D is also engaged in metrology for electrical power supply, which is currently under intensive development in Estonia due to the transition from oil shale to renewable sources like wind and solar energy. In addition, Metrosert takes part in the EC Technology Platform „SmartGrids“.</p> <p>The fast digitalisation of the society means new metrology applications and hence opportunities for Metrosert. Metrosert contributed to the EU Horizon 2020 photometry project to develop a new standard for LED-based lighting. Metrosert participated in translation into Estonian of 6 international standards. Metrosert has for Estonia implemented an electronic sealing and signing system, to replace traditional paper-based signing. Metrosert’s R&D division also carries out a considerable amount of training for personnel in industry and academia.</p>

<p>Scientific basis in the field is sufficient to conduct doctoral studies. (This question should be answered only if: a) institution being evaluated is conducting doctoral studies and; b) The field being evaluated is proposed to grant positive evaluation. If these conditions are met then: a) If the level of scientific basis is sufficient for conducting doctoral studies in every structural unit being evaluated, then the answer should be „yes“; b) If the scientific basis is not sufficient in some structural units, then those units should be listed.)</p>		<p>Not applicable.</p> <p>Although Metrosert is not a degree awarding body, they are currently welcoming a PhD student from TalTech, unfortunately on academic leave. The review panel is considering this very positive and recommends Metrosert to tie closer collaboration with academic partners to expand this opportunity.</p>
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Summary assessment

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<p>Areas of special note as appropriate (Where necessary indicate sub-fields, assessment criteria, and/or structural units which, in the committee's opinion, were of a notably high level.)</p>		<p>Areas of special note of the Metrosert R&D Division include:</p> <ul style="list-style-type: none"> • Their involvement with EURAMET and other European and regional Metrology networks. • Their participation with the EMRP and EMPIR programmes for research and their work on updating national standards and developing new ones (e.g. LED based lighting). • Staff research potential • Application of their research, enabled by the fast digitisation of Estonian society, such as the electronic sealing and signing system, to replace traditional paper-based signing. • Application of their research within resource use efficiency, in particular for power consumption (Smart Electricity Grids). • Application of their research within quantum metrology, in particular for secure telecommunication.
<p>Areas in need of improvement as appropriate (Where necessary indicate sub-fields of the field being evaluated, assessment criteria, and/or structural units which, in the committee's opinion, revealed significant shortcomings.)</p>		<p>The total R&D funding is currently quite modest and also spread into several smaller specialised projects. This means an obvious risk, hence Metrosert has to strive for a more stable long-term funding, preferably based on a limited number of larger projects in cooperation with academic partners (both domestic and international) and other stakeholders. An improved inhouse support for researchers in their application for domestic and international grants or contracts, would then be needed.</p> <p>A research strategy would be needed, defining Metrosert mission and objectives in terms of R&D.</p> <p>Cooperation with universities should be strengthened, for knowledge exchange, joint projects, access to specialised advanced lab equipment, and also for attracting and hiring highly qualified personnel at PhD level. A hiring plan for attracting and retaining highly qualified personnel would be needed.</p> <p>As a platform for collaboration with universities, supervision and possibly employment of PhD students is recommended. Collaboration could also involve supervision of masters' or undergraduate final year dissertations, which could be used as a springboard to enable closer links with higher education.</p> <p>Current premises allocated for R&D labs are insufficient, especially with regard to planned expansion. The committee noted a strongly skewed gender distribution in the R&D division, as there were</p>

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		<p>currently no female staff. Metrosert should introduce initiatives to address this.</p> <p>During the virtual tour of the labs, the panel noticed lack of safety regulations, instructions and - equipment.</p>
<p>Assessment proposal to the Minister of Education and Research</p>	<p>To grant positive evaluation</p>	<p>AS Metrosert, Estonia's calibration and verification laboratory, has been representing Estonia in the European Association of National Metrology Institutes (EURAMET e.V) since 2004. In this role, they have developed three European research programmes and have a permanent position in the Executive Committees in those programmes run by EURAMET. Metrosert are further involved with three European Metrology Networks. Their research activity falls within three thematic areas: (i) metrological support for industry/production and digitalisation in industry, (ii) increasing efficiency in use of resources (power consumption), and (iii) fundamentals in measurement science for quantum metrology and secure telecommunication. Traditional academic publication output of the evaluating institution, however, has been declining. Although statistics cannot be used due to the small group, it is nevertheless noticeable that from 4 high-level publications in 2015 (or 4.44 / FTE) there was only 1 (or 0.48 / FTE) in 2019, with 12 outputs in total. The scientific impact of research has therefore been assessed as satisfactory only.</p> <p>Metrosert is currently dedicating 20% of their budget to R&D which is promising. The current staff involved in R&D is 6 persons (3,3 FTEs) out of which 3 hold a doctoral degree. There are plans to recruit two additional persons in the next months and it is very important for Metrosert to recruit at PhD level to increase their research capabilities. On staffing the lack of female researchers was noticeable. Currently, the revenues generated by domestic or international contracts or grants are modest, 81 k€ and 65 k€ on average per year respectively. Investment costs for lab equipment are high, and could hardly be covered by the current R&D revenues. There are many research potential avenues and the fast digitalisation of the society also offers new opportunities for Metrosert. There is clear potential for research but to make it sustainable, Metrosert need to elaborate a research strategy, ensure a hiring plan, expand the research laboratory facility and increase the collaboration with academic partners. The sustainability and potential of research have therefore been assessed as satisfactory only.</p> <p>Metrology and new measurement techniques are crucial to make future technology available. Metrosert then has</p>

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		<p>a national key role. Metrosert R&D is also engaged in metrology for electrical power supply, which is currently under intensive development in Estonia due to the transition from oil shale to renewable sources like wind and solar energy. In addition, Metrosert takes part in the EC Technology Platform „SmartGrids“. Metrosert’s R&D division also carries out a considerable amount of training for personnel in industry and academia. The societal importance of research has been assessed as good.</p>

Feedback

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<p>Feedback for institution (This question should be answered only if the institution asked for feedback from the evaluation committee in the self-report (about up to three specific areas of R&D which it finds to be currently important, e.g., related to its development plan).)</p>	<p>N/A</p>
<p>Suggestions for unit, institution, state etc (As appropriate, committee can give additional feedback for the structural unit, the institution, or the State (please specify whom feedback is directed to) according to the directive assessment criteria for regular evaluation (article 7).</p>	<p>As highlighted above, the following are suggested to enhance financial sustainability and operation:</p> <ul style="list-style-type: none"> • Develop a clear research strategy, defining Metroser's mission and objectives in terms of R&D. • Provide an improved in-house support system for research applications for funding. • Strengthen cooperation with universities, to enable: knowledge exchange, joint projects, access to specialised advanced lab equipment, publication outputs, and also for attracting and hiring highly qualified personnel at PhD level. • A hiring plan for attracting and retaining highly qualified personnel. • Introduce initiatives to address the lack of Female staff in the R&D division. • Ensure clear and visible safety regulations, instructions and - equipment. <p>Regarding the planned expansion, current premises allocated for R&D labs will need to be revisited, as they appear to be insufficient.</p>