

ELI: Extreme Light Infrastructure – Feasibility Study
Appendix 1: Logical Framework Matrix

Title of the project: Extreme Light Infrastructure (ELI)		Operational Programme: Research and Development for Innovation Priority Axis: 1 European Centres of Excellence	
Locality: Dolní Břežany (Central Bohemia Region), Czech Republic		Total Eligible Cost: CZK 6 800 575 902/ EUR 277 687 869 ¹	
Goal (Overall Objective)	Objectively Verifiable Indicators to the project end date, i.e. 31.12.2015²	Sources and Means of Verification	
<ul style="list-style-type: none"> Strengthen the research, development and innovation potential of the Czech Republic that shall contribute to its economic growth, competitiveness and to the creation of highly qualified workplaces, so that Czech regions can become important locations for the concentration of these activities within Europe. Contribution to cutting-edge European laser research and realization of many research and application projects involving interaction of light with matter at intensities that are 100 to 1.000 times greater than the values achieved at present. The ELI mission will be both fundamental academic research as well as applied research with direct societal applications. 	<ul style="list-style-type: none"> Recognized R&D results (number)³: 391 Gross new jobs in R&D total, form that woman (FTE): 250/ 62 Number of PhD. graduates (number): 10 	<ul style="list-style-type: none"> OP RDI monitoring reports and check on the spot Financial and economic reports of the beneficiary Annual reports of the ELI centre CZSO and RIV statistics EIS (European Innovation Scoreboard) statistics Web pages of the ELI centre 	
Specific Objective of the Project	Objectively Verifiable Indicators to the project end date, i.e. 31.12.2015	Sources and Means of Verification	Assumptions
<ul style="list-style-type: none"> Establishment of the Centre of Excellence forming part of the pan-European multi-site ESFRI ELI project, i.e. research centre equipped with a modern and unique infrastructure, producing excellent research results in an international scale, including results applicable in practice, forming strong strategic partnerships with prestigious research institutions (private and public) in the CR and abroad which contribute to wider integration of the Czech R&D teams into leading international research organizations and European research infrastructures and which contribute to the human resources development in research 	<ul style="list-style-type: none"> ELI-Centre of Excellence in operation Gross new jobs in R&D total form that woman (FTE): 250/ 62 R&D results (number): <ul style="list-style-type: none"> Publications: 377 (2 impacted and 0,5 non-impacted per senior researcher p.a./ 1 impacted per junior researchers and PhD students p.a./ 0,5 non-impacted per junior researchers and PhD students p.a) Patents: 10 Applied research results: 4 Collaborative projects with application sphere (number): 3 p.a. in 2015, 5-8 p.a. in 2016-2020 Researchers using the new infrastructure (number): 193 p.a. in 2015, 491-503 p.a. in 2016-2020 Share of the new infrastructure used by other subjects (%): 60 p.a. (availability for 18 teams working simultaneously) Open access (p.a.): 221 open access days/ 10 open hours beam days/ 23.868 hours Experiments on beamlines (number): ca. 80 research projects p.a. 	<ul style="list-style-type: none"> OP RDI monitoring reports and check on the spot Financial and economic reports of the beneficiary Annual reports of the ELI centre Contracts/ Memorandums with partners/ users Grants awarded CZSO and RIV statistics European patent office Web pages of the ELI centre 	<ul style="list-style-type: none"> see assumptions for expected results and activities
Expected Results	Objectively Verifiable Indicators to the project end date, i.e. 31.12.2015	Sources and Means of Verification	Assumptions
<ol style="list-style-type: none"> New building constructed Laser systems and other equipment installed and commissioned Organizational structure established Research activities initiated Cooperation with users of R&D results initiated Students and graduates involved 	<ol style="list-style-type: none"> Newly constructed premises - total area excl. perimeter walls (m²): 29.758, 6 different experimental rooms, 80 offices, classroom for 40 students, three meeting room/lounges, each for 20 people, a lecture hall for 150 students, a library and reading room, etc. (for detail see chap. 5 of the Feasibility study) Laser systems: 27 functional modules (11 high-intensity independently running beamlines) exceeding price CZK 20 	<ul style="list-style-type: none"> Building diary/ Statement of building acceptance Reports from tenders Contracts and transfer protocols Property records of the beneficiary Organizational structure of the beneficiary Contracts of employment, Labor office statistics, evidences of the beneficiary 	<ul style="list-style-type: none"> Maintaining of political support for the project from the key stakeholders at national and EU level (ESFRI/ European Commission/ Ministry of Education, Youth and Sports of the CR/ Academy of Science of the CR, other international strategic partners of ELI) Smooth cooperation with international partners on the establishment of an European Research Infrastructure Consortium (ERIC), namely

¹ Exchange rate CZK/EUR: 24,49 (Source: <http://ec.europa.eu/budget/infoeuro/> and appreciated by 5%)

² Values of indicators in the table, except for the indicators relating to the newly created jobs and indicators labeled "p.a.", are set cumulatively within the implementation phase of the project, i.e. from 2009 to 2015. For details see chap. 6.4 of the Feasibility study.

³ This indicator is measurable as number of impacted and non-impacted publications, patents, technologies and other recognized results, according to the methodology of the Research and Development Council of the CR.

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	<p>m. and supportive equipment, (for detail see chap. 5 of the Feasibility study)</p> <p>3) New jobs in R&D (FTE): Non research staff (57)/ Researchers (193), from that: Researchers under 35 years old (97)/ Researchers woman (48)</p> <p>4) R&D results (numbers):</p> <ul style="list-style-type: none"> - Publications: 267 IF journals; 110 others - Patents: 7 national IPR, 3 international IPR - Applied research results: 4 prototypes <p>5) Economic results (in CZK):</p> <ul style="list-style-type: none"> - Contract research volume: 2.000.000 - Volume of funds from national grants: 6.000.000 - Volume of funds from international grants: 24.000.000 <p>6) Students/ graduates (MA, PhD) using infrastructure: 118 p.a.</p>	<ul style="list-style-type: none"> • OP RDI monitoring reports and check on the spot • Financial and economic reports of the beneficiary • Annual reports of the ELI centre • Contracts/ Memorandums with partners • National and international grants awarded • CZSO and RIV statistics • Web pages of the ELI centre 	<p>Hungary and Romania, cooperation with key R&D centres and networks (e.g. Laserlab Europe), and cooperation with other strategic partners important for the success of ELI-Beamlines in the CR.</p> <ul style="list-style-type: none"> • Sufficient demand and motivation of users for utilization of capacity and services of the ELI centre (potential for application) • High quality and long-term cooperation with enterprises, universities and research institutions from the CR and abroad (potential for application) • Success in obtaining of national and international competitive grants (long-term financial sustainability) • Securing of sufficient funds from private and other public sources (long-term financial sustainability) • Sufficient young scientists educated in laser research and attracted by ELI
Activities	Means (Inputs)	Time Schedule of Activities	Assumptions
<p>1) Construction of new building</p> <ul style="list-style-type: none"> - Preparation and signature of future purchase contract/ contract for land - EIA and Natura 2000 processes - Planning and building permit processes - Tendering processes - Construction - Trial operation <p>2) Laser system and other equipment installed</p> <ul style="list-style-type: none"> - Procurement of laser system components and other equipment - Baselining the laser design - Development and implementation of laser system - Test operation and commissioning of laser system <p>3) Establishment of organizational structure</p> <ul style="list-style-type: none"> - Institutional set up (establishment of functions/ departments and bodies) - Attraction, selection and training of new research, management and support staff - Finance and administrative management incl. publicity measures/ Scientific management/ Knowledge transfer management/ Facility and safety management - Establishment of ELI-ERIC <p>4) Research activities 1-6</p> <ul style="list-style-type: none"> - RA 1: Lasers generating repetition-rate ultrashort pulses and multi-petawatt peak powers - RA 2: X-ray sources driven by ultrashort laser pulses - RA 3: Particle acceleration by lasers - RA 4: Applications in molecular, biomedical, and material sciences - RA 5: Plasma and high energy density physics - RA 6: Exotic physics and theory <p>5) Cooperation with users of R&D results</p> <ul style="list-style-type: none"> - Establishing the basic directives and models for regulation of intellectual property 	<ul style="list-style-type: none"> • Financial means (internal and external) • Project documentation for construction phase • Project proposal incl. Feasibility study • Actual personal and research capacity of the beneficiary • Selected contractors – their construction, technological and personal capacity • Consultancy services 	<p>1) 01/2009 – 10/2013</p> <p>2) 01/2011 – 12/2015</p> <p>3) 01/2011 – 12/2015</p> <p>4) 01/2011 – 12/2015</p> <p>5) 06/2011 – 12/2015</p> <p>6) 06/2011 – 12/2015</p>	<ul style="list-style-type: none"> • Precise contractual arrangements with reliable and qualified contractors having experience with construction of the building/ delivery of the appropriate technology and equipment • Construction works, supply of technologies and equipment realized according to the time schedule in required quality and financial framework • Adequate financial cover of investment phase of the project (ex-ante payments in time) • Sufficient number of qualified human resources for R&D activities, project management and support activities, incl. their further development and stability in the ELI centre • Sufficient installation, test operation and commissioning of laser system and other support devices • Interest of students and graduates in the field of physics related to laser technologies

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<ul style="list-style-type: none"> - Preparation of Exploitation strategy for the results of R&D - Draft detailed rules, regulations and rules for the operational phase - Start-up of cooperation with research and industrial users <p>6) Students and graduates involved</p> <ul style="list-style-type: none"> - Attraction, selection, education and involvement of new students and graduates in R&D activities - Collaboration with universities from the CR and abroad 			
			<p>Pre-conditions</p> <ul style="list-style-type: none"> • Submission of the decision to grant from the OP RDI MA and the European Commission • Decision of the ELI-PP Steering Committee in order to launch the ELI beamline facility in the Czech republic • Resolving of real estate relationships related to the project • Issue of Planning and Building permit • Issue of EIA and Natura 2000