Overview of Success Stories Table (to be filled in by NCCs)

No.	NCC	Year	Industrial Domain (s)	Problem/ Challenge	HPC Problem Domain	Participating Organisations			HPC Maturity Level (has the Co. adopted HPC as a result of the case)	Other (contact person, etc)
						End-user organisation	HPC provider	Other (Domain Expert, Research organisation, etc)		
1	Austria	2021	Time series analysis	Reducing processing time of time series data for input in ML-model	HPDA - Deploying data on distributed data frame	Hakom	TU.it dataLAB, TU Wien	BOKU - University of Natural Resources and Life Sciences, Vienna Scientific Cluster (VSC) at TU Wien	Not yet. However, the next POC project is already in the pipeline	
2	Austria	2021	Ambient water propulsion systems	Developing a shallow water propulsion system	Highly specialised CFD calculation	Reintrieb	Vienna Scientific Cluster (VSC) at TU Wien	SHAPE programme	Company will reuse HPC for computationally expensive CFD analysis	
3	Turkey	2021	Material sciences	Developing the composite with the best mechanical properties	Molecular dynamics	Nanografi	TRUBA	Middle East Technical University	The company applied for a FF4EuroHPC grant following the case study	Dr. Hande Toffoli ustunel@metu.edu.tr
4	Turkey	2021-2022	Social Media	Large-scale real-time image-based content moderation	Artificial Intelligence, Machine Learning	Machinetutors	TRUBA		The company was able to run many experiments in parallel and quickly see the effects of the model updates. The ability to access multiple GPUs at the same time allowed the company to fine-tune the hyper-	Samet Hicsonmez contact@machinetutors.com

								parameters of each model in order to improve the results.	
5	Finland	2021	Speech recognition	Training large deep learning models to provide AI solutions such as real time spoken understanding to end customers.	Machine learning	Speechly	CSC - IT Center for Science Ltd.	Funding agency:Business FInland	Company has experienced HPC experts and was able to quickly produce results. Will continue using HPC in select cases.	Dan.Still@csc.fi
6	Finland	2021	Maritime technology - Navigation	Awareness system for Autonomous navigation.	Machine learning/deep learning algorithms training for computer vision	Groke Technologies	CSC - IT Center for Science Ltd.	Funding agency:Business FInland	HPC use for neural net training is still on-going. The company has experienced HPC experts. Production system hosted in commercial cloud.	Dan.Still@csc.fi
7	Greece	2021	Bike manufacturing	Designing a bike with lower aerodynamic drag and side forces in a range of operating conditions	CFD-based optimization	Grammarios Bikes	ARIS GRNET	National Technical University of Athens, Parallel CFD & Optimization Unit	The company will reuse HPC for similar, computationally intensive optimizations	
8	Greece	2021	Industrial accident	Problem: CFD dispersion and combustion simulations of flammable substances releases in a large	CFD	Hellenic Petroleum	ARIS GRNET	National Centre for Scientific Research "Demokritos" & Industrial	Unclear	Dr. Elias Tolias tolias@ipta.de mokritos.gr

				industrial area of complex geometry. Challenge: Need for detailed representation of facility Complex analytical turbulence and fire dispersion equations				Fellowship Niarchos		
9	Lithuania	2021	HPC infrastructure	To design the architecture of the supercomputer for solving time-limited hydrometeorological problems for a large country/ land area	HPC architecture design	Novian Technologies, Ltd.	ITOARC at VU MIF	-	Timeframe-specific: HPC resources were used as the main tool to solve the problem	itapc@mif.vu.lt
10	Lithuania	2022	Health/ medicine	Development of effective algorithms for analysis of medical data (electrocardiogram)	Artificial intelligence, Data analysis	Zive, Ltd.	ITOARC at VU MIF	-	Full: company will reuse HPC in the future on the basis of as-needed applications for resources	itapc@mif.vu.lt
11	Cyprus	2021	Real estate	Estimate the price of land plots in an automated way	Artificial Intelligence / Analytics	Axia Valuers / Real Geosolutions	CyI		Not yet	
12	Cyprus	2021	Oil and gas / Energy	Predict critical quality parameters of processed production plant material in real-time conditions	Artificial Intelligence / Analytics	Hyperion Group	CyI		Not yet, in the next phase.	
13	Bulgaria	2022	Automotive sector	Implement a low-cost, low-latency, high-accuracy gesture recognition solution that can be deployed on different edge platforms such as the NVidia Jetson Nano.	Artificial Intelligence/HPC cluster usage	SC LTD.	HPC UNITE cluster at the Sofia University	HPC lab NESTUM cluster	yes	metodi.pankov@gmail.com
14	Bulgaria	2022	IoT	Provide the best solutions for the success of SME	AI controlled convergence of	FTS LTD	HPC UNITE cluster at the Sofia University	HPC lab NESTUM cluster	yes	metodi.pankov@gmail.com

				customers via descriptive and predictive analyzes	component delivery, useful for other companies than FTS.						
15	Sweden	2021	Extracting, analysing, and visualising voice data	Use machine learning to develop their own Swedish-language speech-synthesis model. It will be a key component of a conversational assistant capable of providing information in real time in response to spoken natural-language questions. It will be capable of learning to pronounce jargon relevant to particular domains, such as banking. It will generate audio streams quickly, so that users will be comfortable with natural conversation flow, without pauses for generating long replies.	Artificial intelligence, natural language processing	Voxo AB	Jülich Supercomputing Centre	ENCCS (https://enccs.se/)	Yes		thor.wikfeldt @enccs.se
16	Sweden	2021	Materials science, battery development	Devising bottom-up design strategies for improved batteries. This is an area of intense research, with high societal impact: electric mobility has the potential to significantly reduce CO_2 emissions of the road transportation sector, which currently accounts for about one-fifth of total CO_2 emissions in Europe.	Classical and reactive molecular dynamics and quantum chemical simulations	Northvolt AB	Vega at IZUM (The Institute of Information Science)	ENCCS (https://enccs.se/)	Yes		thor.wikfeldt @enccs.se
17	Estonia	2022	Autonomous	Autonomous cars acquire	Artificial intelligence,	Bolt	HPC Centre of the	Autonomous	Yes		ylar.allas@ut.

			vehicles	up to 357 GB/hour of data during test drives. Autonomous car engineers needed a system to store and easily access those test logs.	Data analysis		University of Tartu	Driving Lab, University of Tartu		ee
18	Estonia	2021	Language technology	Translation agency needed a custom-made machine translation system to reduce the time of translations.	Artificial intelligence, machine learning	Luisa Tõlkebüroo OÜ	HPC Centre of the University of Tartu	TartuNLP	Unclear, the project was successfully completed	ylar.allas@ut.ee
19	Norway	2022	Materials science,	Anomaly Detection of Noisy Time Series	Machine learning	3B-Finreglass AS	NORCE AS		yes	kljo@norceresearch.no
20	Hungary	2022	Software engineering	Assessment of KIFÜ HPC („Miskolc") performance for CFD simulations using ANSYS Fluent software.	CFD simulations	eCon Engineering Ltd.	KIFÜ HPC Cluster („Miskolc")		Not yet	Ligeti.laszlo@kifu.gov.hu
21	Hungary	2022	Engineering / design	Desire for of animations about designed power plant, biochemical plants,etc. Rendering time is too high.	Industrial animations	Euroil Industrial and Trade Co.Ltd.	KIFÜ HPC Cluster („Debrecen2")		Not yet	Ligeti.laszlo@kifu.gov.hu
22	Italy	2021	Pharma / Health	Application of Computational-Aided Drug Design technologies to virtually identify the known drugs (repurposing).	HPC /AI	Dompè	CINECA (Ialy), Eni (Italy), BSC (Spain), Julich (Germany)	Dompé, University of Milan, Politecnico of Milan, KU Leuven, Fraunhofer Institute for Molecular Biology and Applied Ecology (IME), University of Cagliari, Elettra Synchrotron Trieste, International Institute of Molecular and	yes	m.ortali@cineca.it, c.arlandini@cineca.it

							Cellular Biology, University of Naples Federico II, National Institute for Infectious Diseases Lazzaro Spallanzani (Rome)		
23	Germany	2015- 2016	Laser-based welding	Assess the impact of flaws on the durability of welded elements in automobiles and machine tools.	Simulation of non-linear behaviour of materials and highly transient conditions.	Lasersystemtechnik Bollinger & Ohr (LBO)	HLRS	Lauer & Weiss (L&W), Fortissimo Project	Finalised: Using cloud-based-HPC simulations for welding trials, L&W can generate a significant cost reduction.	lorenzo.zanon@hlrs.de wierse@sicos-bw.de
24	Germany	2015- 2018	Ultra-high-temperature furnaces (CFD)	Determine the temperature distribution and flow inside a furnace.	Deal with the interdependencies of convection, conduction, radiation, joule heating and a complex multi-material geometry.	XERION	HLRS	NAVASTO, Fortissimo Project	Finalised: With an improved furnace design process, XERION expects to triple the return on investment by 2023.	lorenzo.zanon@hlrs.de wierse@sicos-bw.de
25	Romania	2021	Quantum computing / Space manufacturing	Establishment of a laboratory for RDI activities in the field of quantum communications and development of equipment and systems for quantum communications level TRL = 1-4	HPC architecture design	Institute of Space Science	In-house infrastructure and resources	ICI Bucharest	Not yet	roncc@ici.ro
26	Romania	2021	Quantum Computing/Space manufacturing	The need for computing power and fast runtime capabilities in order to implement and test optimized solutions.	HPC optimization	Institute of Space Science	In-house infrastructure and resources	ICI Bucharest	Not yet	roncc@ici.ro
27	North	2021	Digital Marketing	Increase the efficiency of	Natural language	Influencers Club	FCSE, UKIM	Domain expert:	implemented	ivica.dimitrovs

	Macedonia			the data team of the company by 100% by using AI techniques for data analytics	processing (NLP) Real time search, analysis and visualization of large-scale data			Ivica Dimitrovski		ki@finki.ukim.mk
28	North Macedonia	2021	Digital Marketing	Automated latency bounded voucher creation out of a large pool of crawled content data using recent advancements in NLP for automated text generation and paraphrasing	Natural language processing (NLP), GPU optimization and elastic resources allocation	Intertec	FCSE, UKIM	Domain expert: Gjorgji Madjarov	Implemented	gjorgji.madjarov@finki.ukim.mk
29	North Macedonia	2022	Bioinformatics	Understanding the language of non-coding and coding DNA with their underlying epigenomic context. Develop an AI model(s) from high DNA data volumes that will be able to detect cellular identities in liquid biopsy samples based on reference molecular fingerprints from healthy and diseased states.	Natural language processing (NLP), parallel processing and distributed machine learning	Nuclein LLC	FCSE, UKIM	Domain expert: Gjorgji Madjarov	Not yet	gjorgji.madjarov@finki.ukim.mk
30	EPCC	2021	Recycling	Currently, most recycling centres and plants operate by having human pickers sort through recycled goods on conveyor belts – any recyclable of the wrong category (eg any soda can in the paper recycling) is	AI / Robotics	Danu Robotics	EPCC		Prototype	j.sindt@epcc.ed.ac.uk

				manually removed from the conveyor belt and either sorted into the correct category or disposed of if not recyclable.						
31	Czech Republic	2021	Energy Production	CFD simulations with chemical reactions	CFD	Orgrez	IT4Innovations National Supercomputing Center		project for national grant submitted and funding received	Dr. Tomáš Karásek tomas.karasek @vsb.cz
32	Czech Republic	2021	medical devices	Structural mechanics/product optimisation	digital model	Mobster	IT4Innovations National Supercomputing Center		searching for funding to continue the collaboration	Dr. Tomáš Karásek tomas.karasek @vsb.cz
33	Spain	2021	Automotive	Create a computing application demonstrator with extreme computing needs. The project included the development and implementation of computational solutions.	HPC simulation	APPLUS/IDIADA	CSUC		Participants have been able to easily perform their simulations.	
34	Spain	2021	Energy	Application of computational models to simulate anaerobic digesters and to help in the design and optimization of the energy balance is a possible resource for the development of advanced digesters.	HPC simulation	NORVENTO	CESGA	EnergyLab. Universidad de Miño.	The project ended successfully.	Link

35	EPCC	2022	Air Traffic Control	We have a flight optimisation algorithm based on industry standard models for take off and landing cycles at airports. It is a non linear equation with over 350 unknowns and 500 constraints. Currently there is no off-the-shelf quantum algorithm for tacking nonlinear optimisation problems. NATS will review the model and all collaborators will work together to produce a valid linear model.	Quantum Computing	Quantum Base Alpha		EPCC	Ongoing	m.sawyer@epcc.ed.ac.uk
36	Latvia		Mettallurgy	Real life prototype of a new liquid metal mixing furnace is expensive to build and test. Simulation is needed.	find liquid metal mixing furnace configurations that offer the best mixing conditions and efficiency	EPM Riga	EPM Riga	-		
37	Montenegro		Agriculture	monitor the number of chickens, their weight, and dead chickens		DigitalSmart	Yotta AC	DigtalSmart and UDG		
38	Montenegro		Weather forecast	WRF model is used for weather prediction on IHMS cluster on daily basis and on smaller cluster with worse performances	Speedup numerical weather prediction		Yotta AC	Institute for hydrometeorology and seismology (IHMS) and NCC Montenegro	Ongoing	