

# TDR preparation

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# JOINT INSTITUTE FOR NUCLEAR RESEARCH

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December 13, 2022

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## **Technical Design Report of the Spin Physics Detector**

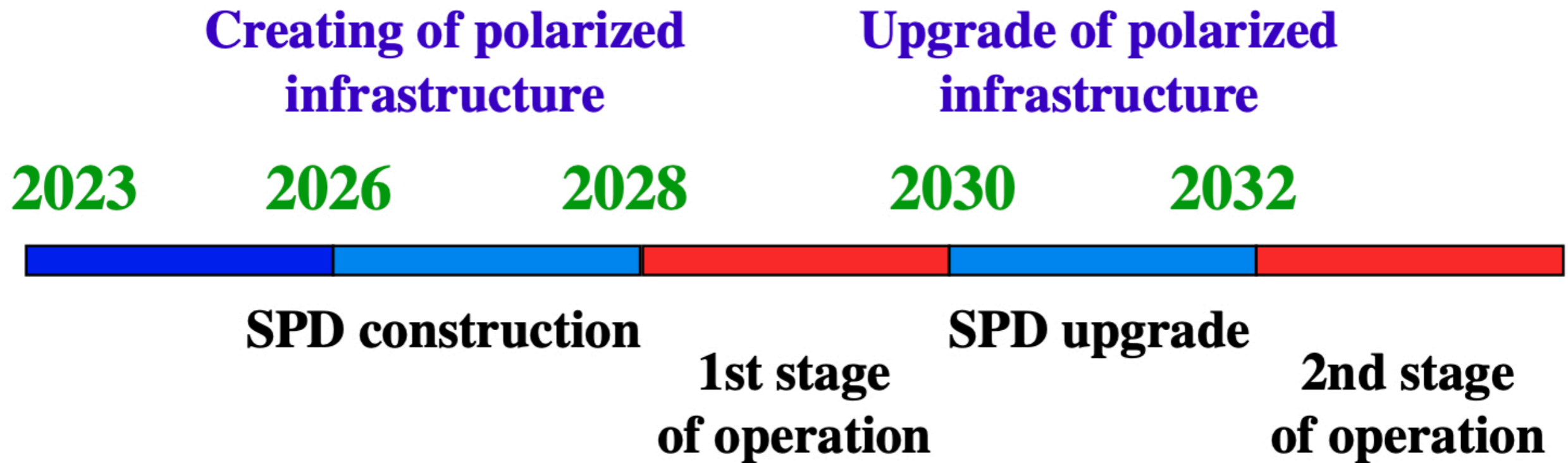
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The SPD collaboration

- Document is complete. It contains all the information needed to review the project
- Document is self-consistent and non-contradictory
- Document reflects the situation with cost and availability of equipment and materials as of February 2022
- Document will be reported to the JINR Program Advisory Committee for Particle Physics in Jan, 2023
- Document still contains some misprints, typos, sloppy wording etc. that will be corrected
- Document is not final

# Two stages



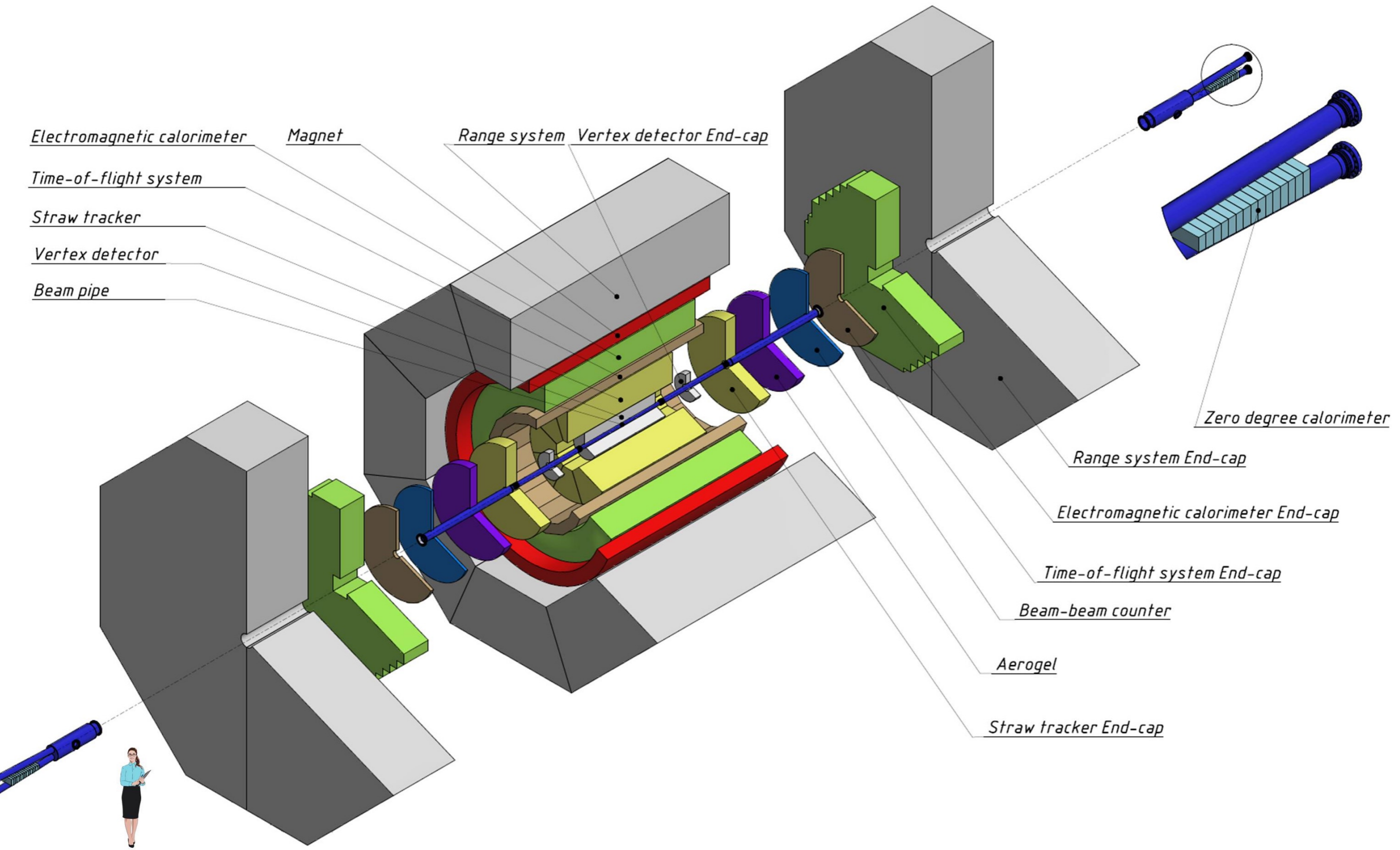
# Expected significant update

- Calculation of the load on the floor of the experimental hall

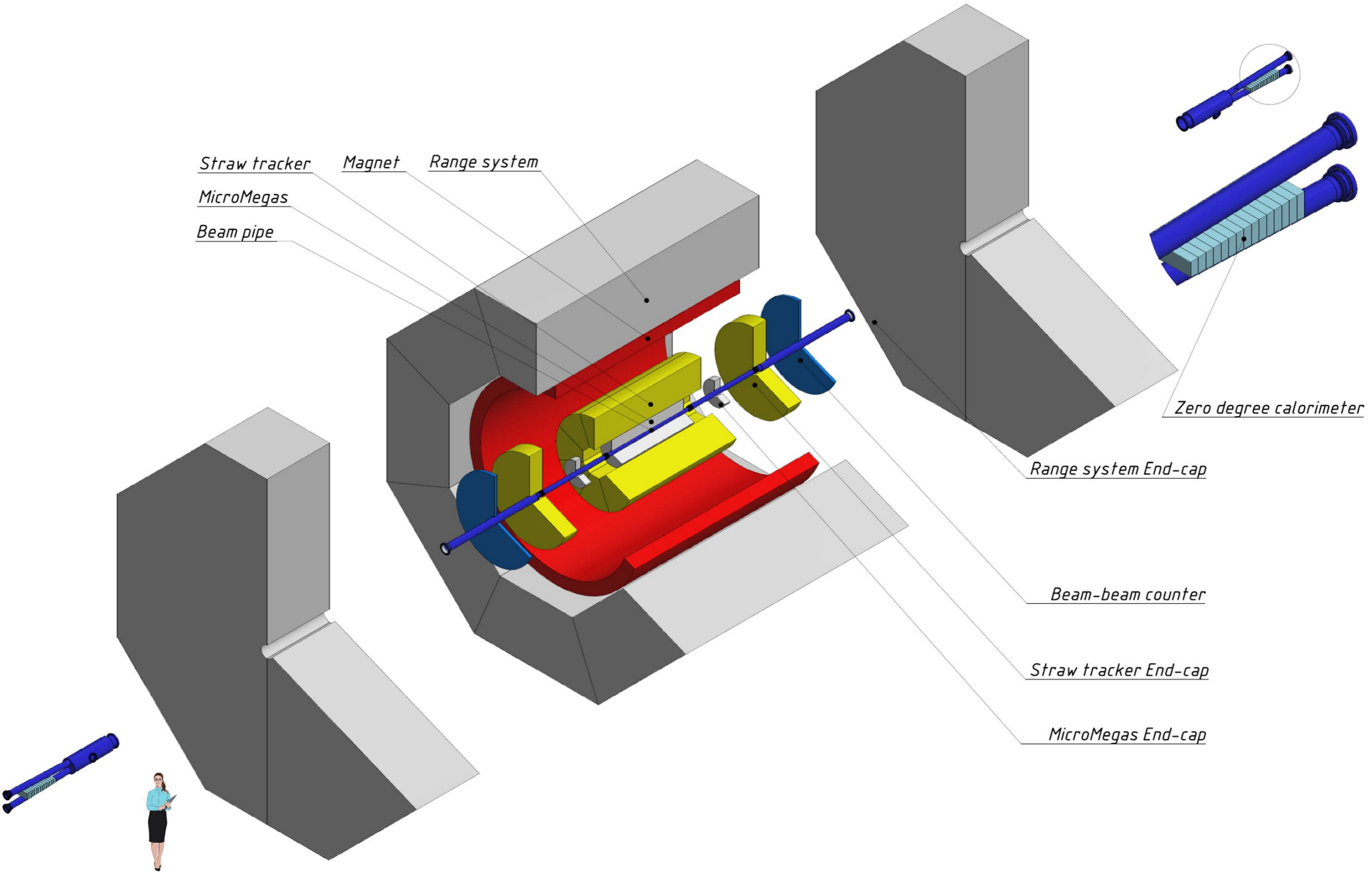
# Cost estimate

The estimated cost of the Spin Physics Detector in its full configuration is about 85 M\$ at current prices (Feb, 2022, 1 Euro = 1.15\$). 45 M\$ of this amount is the cost of the first stage. Any expenses related to the development and construction of the infrastructure for polarized beams at NICA are out of this estimation.

Subsystem	Option	Phase	Cost, M\$
SPD setup	Vertex detector:		
	– DSSD	II	7.3
	– MAPS	II	13.5
	Micromegas Central Tracker	I	0.9
	Straw tracker	I+II	3.0
	PID system:		
	– TOF	II	2.0
	– Aerogel PID system	II	2.4
	ECAL		
	– Phantom	I	0.4
		I+II	9.4
	Range system	I+II	16.1
	ZDC	I+II	0.6
	BBC	I+II	0.5
	Magnetic system		
	Novosibirsk option	I+II	9.2
	JINR option	I+II	8.6
	& cryogenic infrastructure		
	Novosibirsk option	I+II	6.4
	JINR option	I+II	6.1
	Beam pipe		
	– Al	I	0.1
	– Be	II	0.4
General infrastructure		I	1.2
		I+II	1.7
Slow control system		I	1.0
		I+II	1.8
Data acquisition system		I	0.8
		I+II	1.9
Computing		I	5
		I+II	15*
	* + 4.5 M\$ per year for tapes		
TOTAL COST	stage I		45.2
	stage I+II		84.8







*Straw tracker*

*Magnet*

*Range system*

*MicroMegas*

*Beam pipe*

*Zero degree calorimeter*

*Range system End-cap*

*Beam-beam counter*

*Straw tracker End-cap*

*MicroMegas End-cap*



**I propose the Board to approve officially  
the present\* version of the SPD TDR for its  
presentation at PAC**