CLIC Readiness Report (RDR)
Project Meeting Update

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and all contributors

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ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
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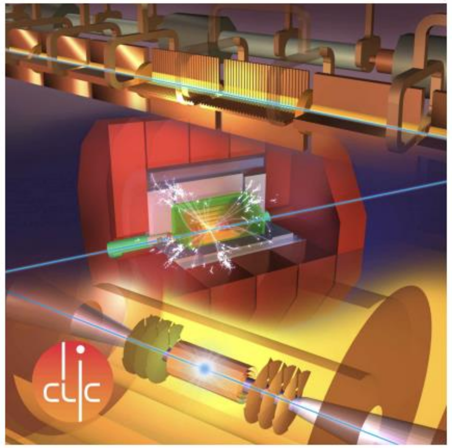

THE COMPACT LINEAR COLLIDER (CLIC)
READINESS REPORT

GENEVA
2024

What to deliver

As support to the ESPPU, and as a future reference for CLIC:

The CLIC readiness report (RDR). Long document.

- Much **based on the 2018 Project Implementation Plan (PIP)**
- Updated where needed (parameters, energy options, new developments)
- Completed with implementation details not found in the PIP
- RDR will be **published as an European Physical Journal** article (template)
- **Author list** – still TBD – but will be inclusive :
    - current collaboration?
    - + earler lists from PIP+Snowmass with an **opt-out?**

As input to the ESPPU:

A 10 pages summary.

- Based on the updated RDR.

Baseline vs options

- Baseline: 380 GeV machine - “low-energy machine”
  - Main parameters, system overview and technology details should primarly refer to **380 GeV**. Base luminosity **50% higher** than in the PIP (see next talk)
  - Keep details on klystron options, no further development planned
  - Option**: 100 Hz**, with 65% higher power
  - At 100 Hz: two **BDS and IPs**

- Option: 250 GeV

- High-energy machine: 1.5 TeV
  - Re-use previous studies
  - Mention up to 2 TeV with a single drive-beam, 3 TeV with two drive-beams
  - No work planned for the 3 TeV machine, but one can refer to the CDR when needed

Contents

Workflow

- One master document
- Copy to all authors for specific updates
- Plan is to merge...

All Projects

readiness report

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Contents

Addition of component overview

- Details of subsystem component exist, but are sometimes not included in PIP (or any other formal doc)
- Goal: add a subsection with component summary for each subsystem
  - magnets
  - RF (# structures, klystrons, modulators)
  - instrumentation
  - etc.
- Example: magnet system summaries in [2018 CLIC PBS External Review]

Examples:

Main Beam – Damping Rings (1/2)

- Based on inputs from Y. Papaphilippou
- PDR

Magnet Type	Quantity	Cost Avg Unit (kCHF)	Total cost (kCHF)	Comment
D17	38	208.2	7911	
Q30L20	36	63.7	2292	
Q30L28*	128	72.9	9327	Scaled from Q30L20
Q30L35*	32	75.8	2426	Scaled from Q30L20
S300	110	36.4	3999	
ST03	156	18.2	2836	
SKQ5	38	20.0	760	
		TOTAL	29551	

*Q30L28 and Q30L35: new types in 380 GeV baseline

Main Beam – Beam Transport (RTML)

- Based on inputs from A. Latina
- Includes e- and e+ beams
- No specifications for corrector magnets yet, considered initial amount of 5 kCHF/magnet

Element name	Units	Cost/unit [kCHF]	Total cost [kCHF]	Comment
D1	6	38.9	234	
D2T1	29	46.4	1345	
D2T2	659	49.2	32404	
D3	16	122.0	1951	
D4	8	87.7	702	
Q1	292	38.3	11193	
Q2	144	27.8	3997	
Q3T1	89	17.2	1532	
Q3T2	34	20.5	699	
Q3T3	280	23.6	6615	
Q4T1	36	8.0	287	
Q4T2	357	10.1	3622	
Q4T3	354	11.8	4164	
Q5	87	5.6	485	
SX1	12	19.7	236	
SX2	529	12.4	6572	
Correctors*	1673	4.1	6940	Preliminary estimate 5 kCHF/magnet
Total	**4605**		**82976**	

One per quadrupole, no parameters defined yet

Main Beam – Beam Delivery System (2/2

Magnet Type	Quantity	Cost Avg Unit (kCHF)	Total cost (kCHF)
B3A	48	15.06	723
B3B	48	15.06	723
B4A	48	10.00	480
B4B	48	10.00	480
BTFQ1	2	222.65	445
BTFQ2	2	149.22	298
BTFQ3	2	155.06	310
BTFQ4	2	171.39	343
FQD	2	131.88	264
FQD2	2	48.8	98
FQF	2	164.61	329
FQF2	2	161.48	323
QCBCOL	36	76.22	2744
QD0	4	335	1340
QD1BC	16	51.1	818
QD2	2	31.23	62
QD4A	2	29.8	60
QD4B	2	29.8	60
QD6B	4	35.2	141
QD6C	2	36.62	73
QD7	2	47.66	95
QDBCOL	16	98.38	1574
QDEC	16	25.94	415
QF1	2	87.71	175
QF1BC	8	73.44	588
QF2BC	8	37.21	298
QF3A	2	27.06	54
QF3B	2	20.81	42

Magnet Type	Quantity	Cost Avg Unit (kCHF)	Total cost (kCHF)
QF5A	4	48.82	195
QF5B	4	46.01	184
QF8	2	10.00	20
QFBCOL	36	51.1	1840
QFEC	16	53.07	849
QMD11	2	116.02	232
QMD12	2	178.69	357
QMD13	2	150.35	301
QMD14	2	85.3	171
SD0	2	335	670
SD4	2	60.5	121
SD5	2	134.06	268
SD5L	2	10.00	20
SD5R	2	10.00	20
SF1	2	43.83	88
SF5	2	38.69	77
SF6	2	57.47	115
SFFB1	20	10.00	200
SFFB2	20	11.05	221
SFFB3	20	13.8	276
SFFB3B	20	11.05	221
SFFB4	20	10.00	200
SFFSB1	80	10.00	800
SFFSB1A	20	10.00	200
SFFSB1B	20	10.00	200
SXEC2	16	10.00	160
SYEC2	32	10.00	320
TQD	2	187.47	375
TQD2A	2	111.06	222

Magnet Type	Quantity	Cost Avg Unit (kCHF)	Total cost (kCHF)
TQD2B	2	111.06	222
TQD3A	2	104.08	208
TQD3B	2	104.08	208
TQD4A	2	111.99	224
TQD4B	2	111.99	224
TQD5	2	131.88	264
TQD6A	2	35.33	71
TQD6B	2	35.33	71
TQD7A	2	35.33	71
TQD7B	2	35.33	71
TQD8	2	179.13	358
TQD9	2	228	456
TQF	2	164.61	329
TQF2A	2	112.99	226
TQF2B	2	112.99	226
TQF3A	2	72.33	145
TQF3B	2	72.33	145
TQF4A	2	112.99	226
TQF4B	2	112.99	226
TQF5A	2	72.33	145
TQF5B	2	72.33	145
TQF6A	2	61	122
TQF6B	2	61	122
TQF7A	2	35.33	71
TQF7B	2	35.33	71
TQF8A	2	35.33	71
TQF8B	2	35.33	71
TQF9	2	210.28	421
		TOTAL	27483

Deadlines

- Status report from (some) authors: Wed 11 Dec, 2024
- **Completed input from authors: January 15, 2024**
- Complete draft of RDR: February 15, 2025
- Final draft of 10 page summary: Mar 1, 2025
- 10 page summary submission: Mar 31, 2025
  - Complete RDR available together 10 page summary as supporting document
- EPJ review process starts for RDR
- Submission of RDR by Summer 2025