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Compact 

## WP2: Planning for the CDR

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## What is the purpose of a Conceptual Design Report?

- To state the project goals
- To justify and present a self-consistent description of the design choices made for each component of the facility
- To make a convincing case that
  - the facility design will meet the required output specification
  - the feasibility and risk of the design choices is well understood
  - remaining technical challenges are identified with a clear R&D path to overcoming them
- To provide a cost estimate

## What a Conceptual Design Report is not:

- A detailed technical description of each system and subsystem.

SECTION	SUB-SECTION	WPs	PREVIOUS RELEVANT REPORTS	REPORTS DUE AT SAME TIME AS CDR
<b>1. Executive summary</b>		1,2		D1.2 Production of a short monograph summarizing the Conceptual Design Report.
<b>2. Introduction</b>		1,2	All	
<b>3. Science Goals and Photon Output Requirements</b>	1. Summary of Science Case	2	D2.1 Report providing users requirements and FEL performance specification (M12)	
	2. Photon Output Requirements	2	D2.1 Report providing users requirements and FEL performance specification (M12)	
<b>4. Systems design and Performance</b>	1. Facility Layout	2,6	D2.2 Report summarizing the FEL design with accelerator and undulator requirements (M24)	
	2. Injector	3	D3.1 Evaluation report of the optimum e-gun and injector solution for the CompactLight CDR. (M18) D3.2 A review report on the bunch compression techniques and phase space linearization (M18)	D3.3 Design report of the injector diagnostics/beam manipulations based on Xband cavities D3.4 E-gun and injector Design Report with diagnostics and phase space linearizer
	3. RF Systems	4	D4.1 Computer code report for RF power unit design and cost optimization. (M18)	D4.2 Design report of the optimized RF unit D4.3 Report on RF unit design and fabrication
	4. Undulators	5	D5.1 A review report comparing the different technologies for the CompactLight undulator. (M18)	D5.2 Conceptual Design Report of the undulator
	5. Accelerator Lattice Design and FEL Performance	6	D6.1 Review report on the most advanced computer codes for the facility design (M18)	D6.2 Final report with start to end facility simulations
	6. Photon Beamlines and User Facilities	2		
	7. Building and Site Considerations	2		
<b>5. Strategic Issues</b>	1. Global Integration	7	D7.1 Mid-term report with CompactLight global integration and cost analysis (M24)	
	2. Cost Estimates	7	D7.1 Mid-term report with CompactLight global integration and cost analysis (M24)	
	3. Technology Transfer	7		
<b>6. Appendices</b>	1. Institutes	1		
	2. Publications	1		

## CDR Production

- Each WP leader to be responsible for providing relevant material, as described in table on previous slide.
- As far as possible, material from any WP reports already produced as deliverables can be reused in the CDR.
- N.B. Those WP reports that are due at the same time as the CDR must be fully consistent with content provided for CDR.
- We propose to compile the report in Latex, using Overleaf which has worked well so far for WP reports
  - multiple collaborators can work on document simultaneously
  - document history, Dropbox and GitHub sync
  - no local Latex installation required

## CDR Production – Points to note

- Vector-based graphics files are strongly preferred to bitmap formats as they reproduce at full resolution irrespective of scaling.
- To help obtain a uniform style, we propose the following guidelines
  - We write about the CompactLight finished design in the present tense and in the third person. For example,
    - **we do say** “the undulators for the hard X-ray beamline are superconducting helical devices with a 2mm aperture and a 4mm period”
    - **we don't say** “we decide that the undulators will be...”
  - However, in discussing the process that led to the final design, we use the past tense and the third person. For example,
    - **we do say** “a number of different technology options were evaluated”
    - **we don't say** “we consider a number of technology options”
  - The idea is that this helps distinguish between the **process** of designing CompactLight and the final **result** and by presenting the finished design in the present tense it makes it seem ‘more real’

Process = past tense  
Result = present tense  
Always third person

# 2020 CDR Proposed Schedule

Date	Task/Milestone	Responsibility of..
January 16	Complete document structure/subfiles/directories set up in Overleaf	WP2
September 30	1 <sup>st</sup> complete draft which includes all material submitted by WP leaders	All
During October	Cross checking for consistency, errors and omissions	All
	Layout editing, style editing, editing for consistency	WP2
October 31	1 <sup>st</sup> complete edited draft.	WP2
During November	Corrections	WP2 + All
November 30	2 <sup>nd</sup> complete edited draft	WP2
December 18	Submission to EU (pre-Christmas)  	WP1
January 2021	Online publication (and printed copy?) once approved by EU.	WP1/2

## Examples of other FEL Facility CDRs

- STFC CDRs
  - 4GLS
  - NLS
  - CLARA (*compiled in Latex*)
- Other CDRs
  - LCLS
  - Fermi@Elettra
  - SwissFEL

pdfs of all the above available on the WP2 Collaborative Workspace:

<https://espace.cern.ch/compactlight/WP2/>