



# Cost Estimates for the ILC Damping Rings

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## Goal is to provide some information for config decision

A detailed estimate with confidence at the level of  $\sim \$1\text{M}$  is not needed at this stage.

We should be looking for differences between the configuration options at the level of several  $\times \$10\text{M}$ , or even  $\$100\text{M}$ .

The different configuration options should be compared on an equal basis where possible, i.e. using same unit cost for comparable components.

We have drawn up a spreadsheet to allow fair comparison between the different lattices representing the different configuration options.





## We used various sources for the unit costs

Ansaldo estimates for TESLA TDR provide a lot of detail.

But some specifications have changed, e.g. need for 0.1 ntorr vacuum in parts of the electron rings to avoid fast-ion instability.

We have obtained expert advice for particular subsystems, including:

RF

Vacuum

Wiggler

Most of the present unit costs have been carried forward from US Technology Options Study.

We are aiming to express costs in 2005 US\$.

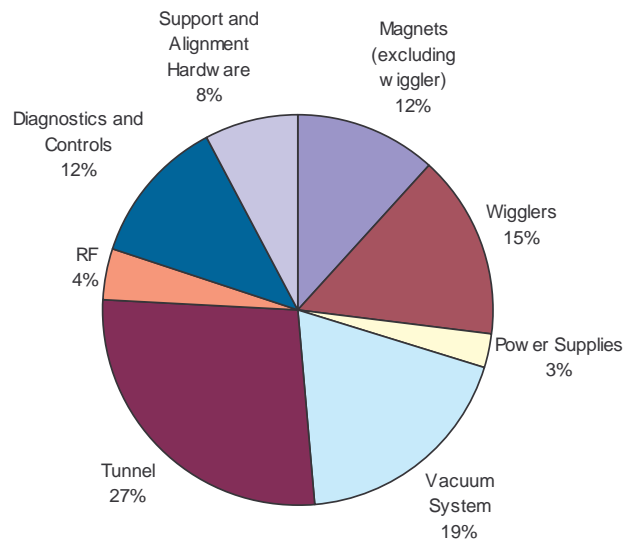
Only hardware costs and tunnel costs are included.

No assembly and installation, management, or contingency.

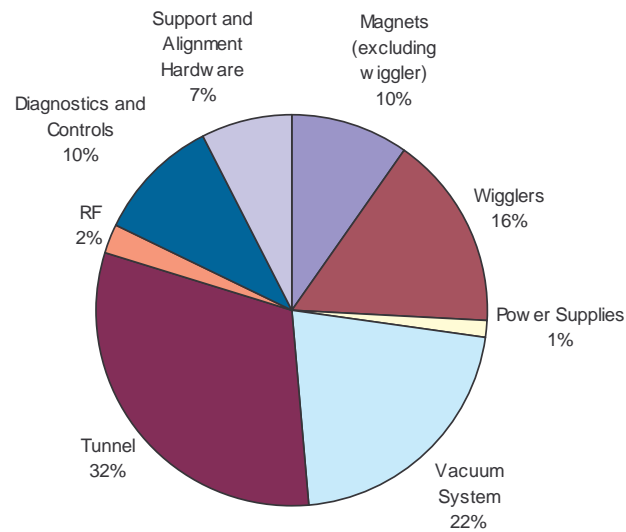


# Cost drivers are tunnel, vacuum and wiggler

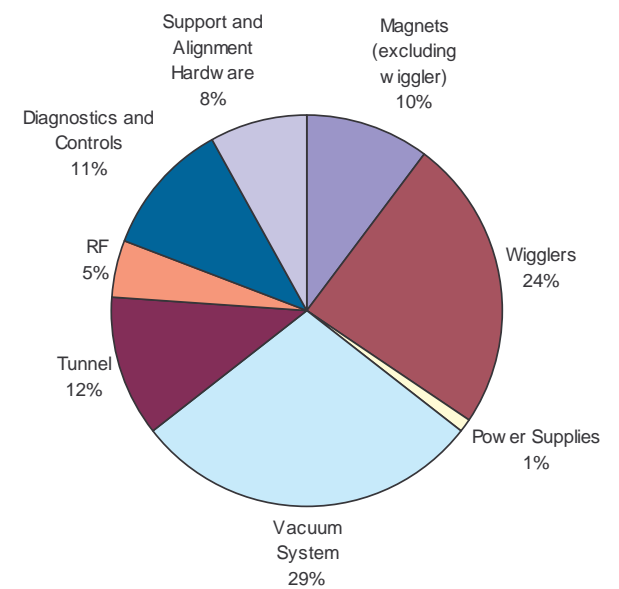
## 3 km Ring



## 6 km Ring



## 17 km Ring



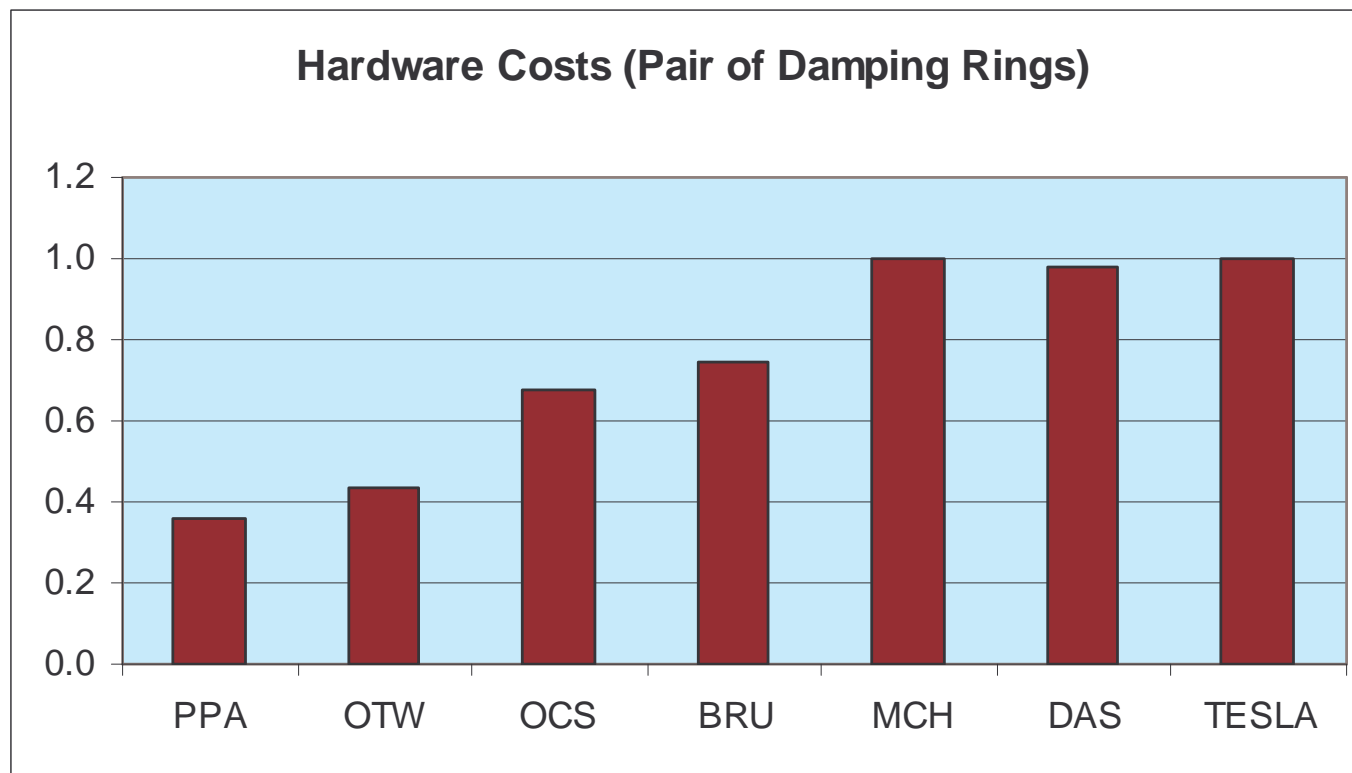


## Costs relative to TESLA DR

Using present assumptions and unit costs (subject to change!):

6 km rings are ~ 75% of the cost of a 17 km ring.

3 km rings are ~ 40% of the cost of a 17 km ring.





## Next steps

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We need to review and refine the unit costs for various items.

The focus should be on the tunnel, vacuum system and wiggler.

We need to work with Global Group 5 to ensure consistency with costing of other parts of the machine.