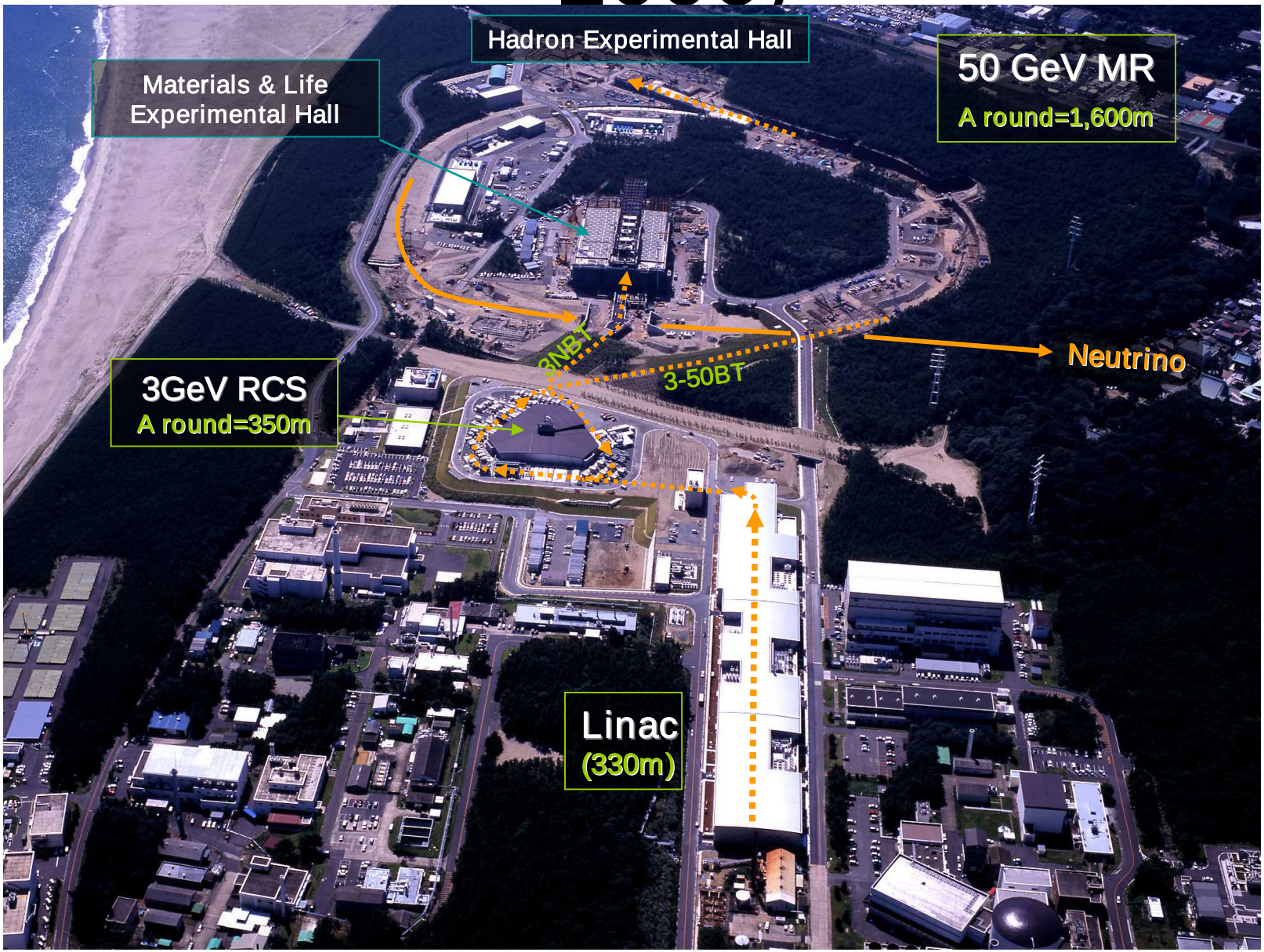
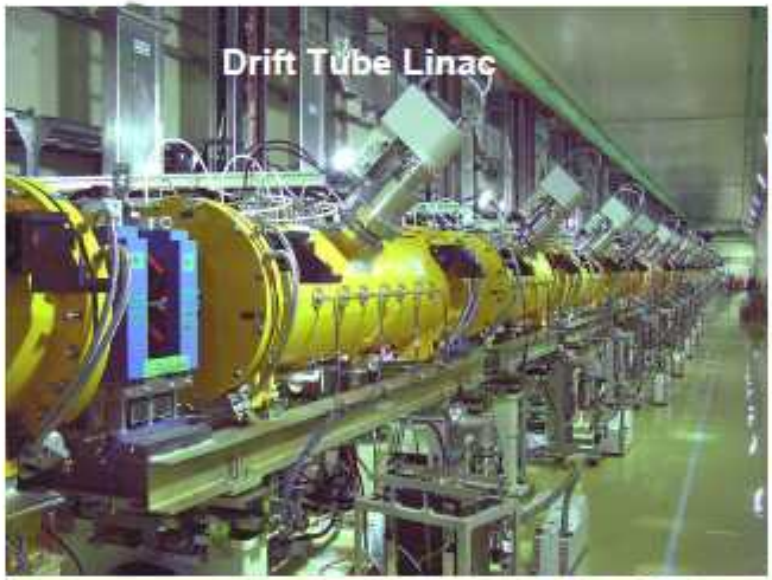
Q&A on T2K

- construction of beam line
- near detectors
- budget
- collaboration (contribution from each)
- T2KK

Bird's-Eye View (Feb. 2006)





Klystrons + Electric Powers

3 GeV Synchrotron Area

3 GeV Tunnel

50 GeV Synchrotron Tunnel

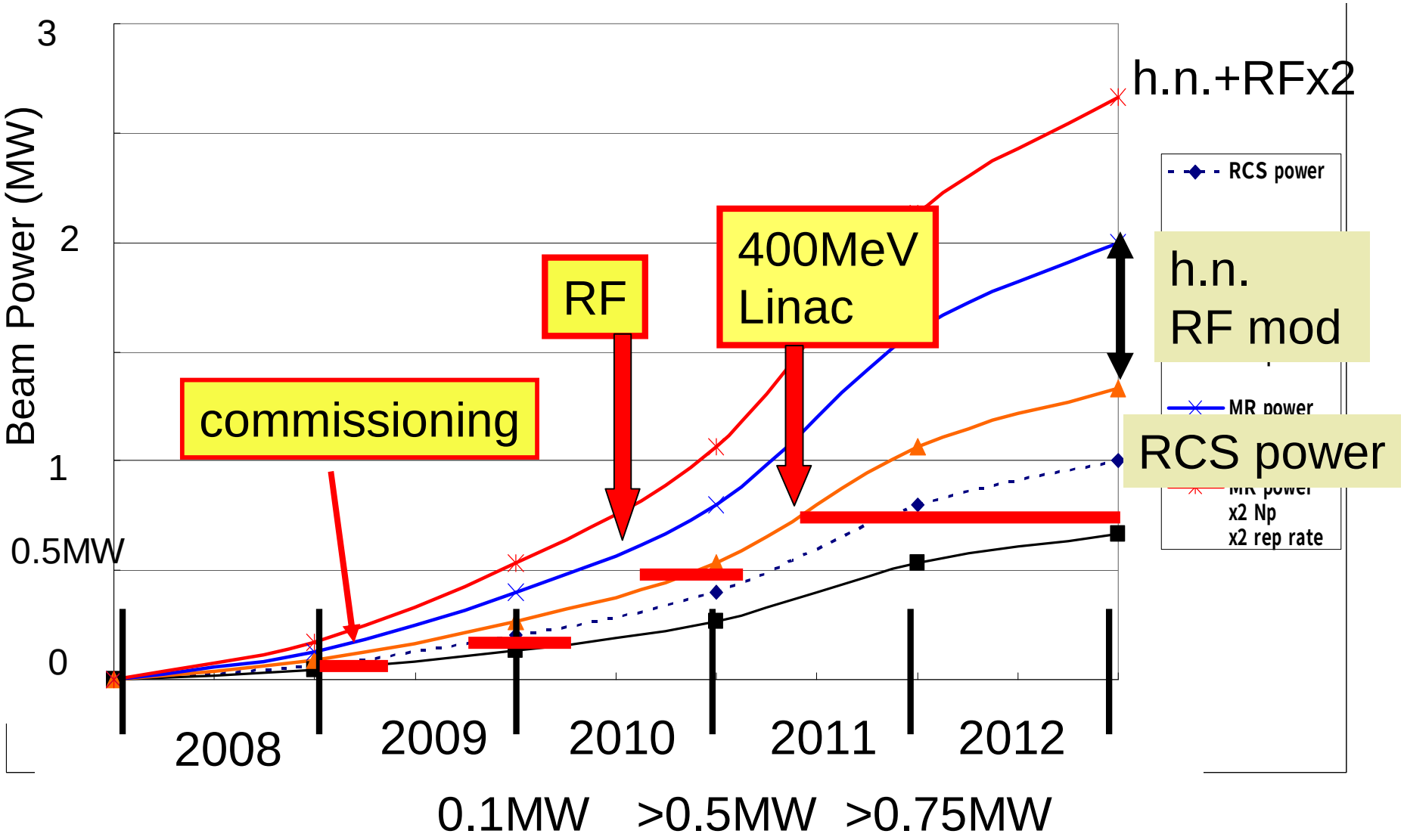
From 3 GeV to Life & Materials Experimental Hall

Primary Beam-line

March, 2006

July, 2006

plan


Beam Power (MW)
3
2
1
0.5MW
0
h.n.+RFx2
RCS power
h.n.
RF mod
400MeV
Linac
RF
commissioning
RCS power
x2 Np
x2 rep rate
2008
2009
2010
2011
2012
0.1MW
>0.5MW
>0.75MW

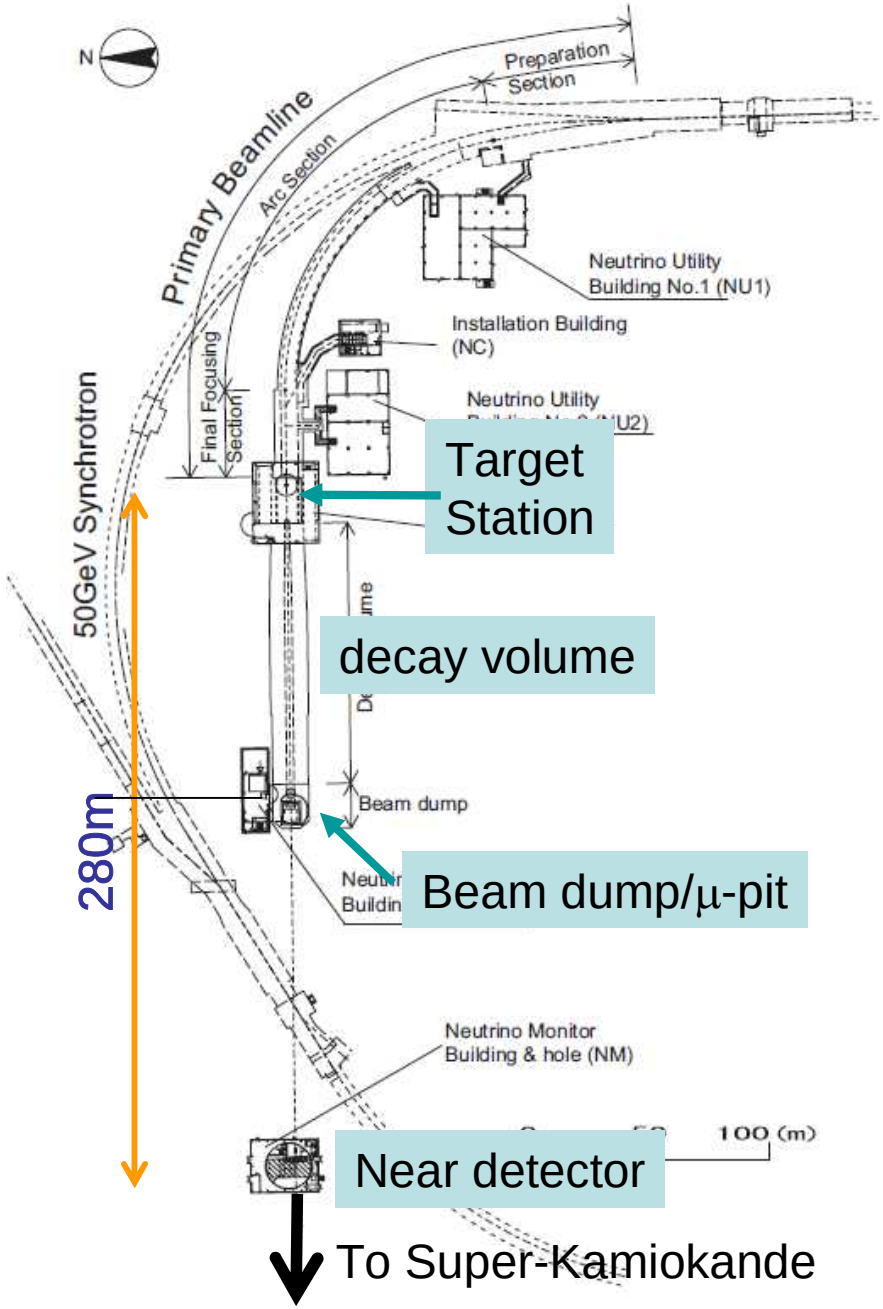
Neutrino Beam Line for T2K Experiment

Components

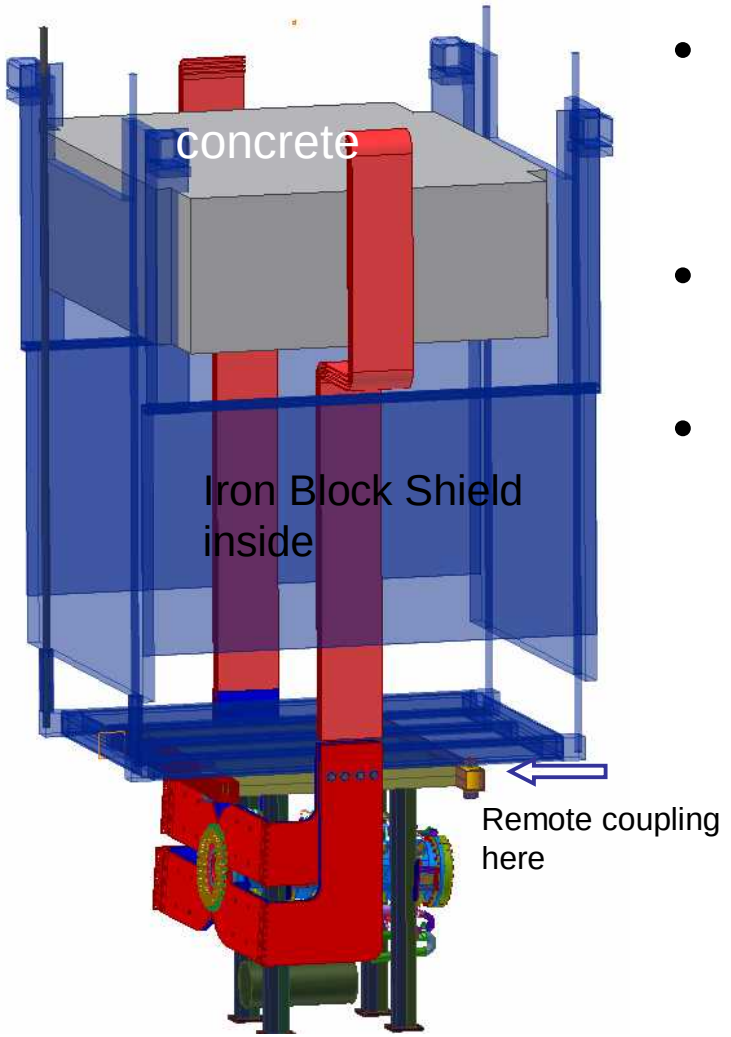
- Primary proton beam line
  - Normal conducting magnets
  - Superconducting arc
  - Proton beam monitors
- Target/Horn system
- Decay pipe
- Beam dump
- muon monitors
- Near neutrino detector

Special Features

- Superconducting combined function magnets
- Off-axis beam

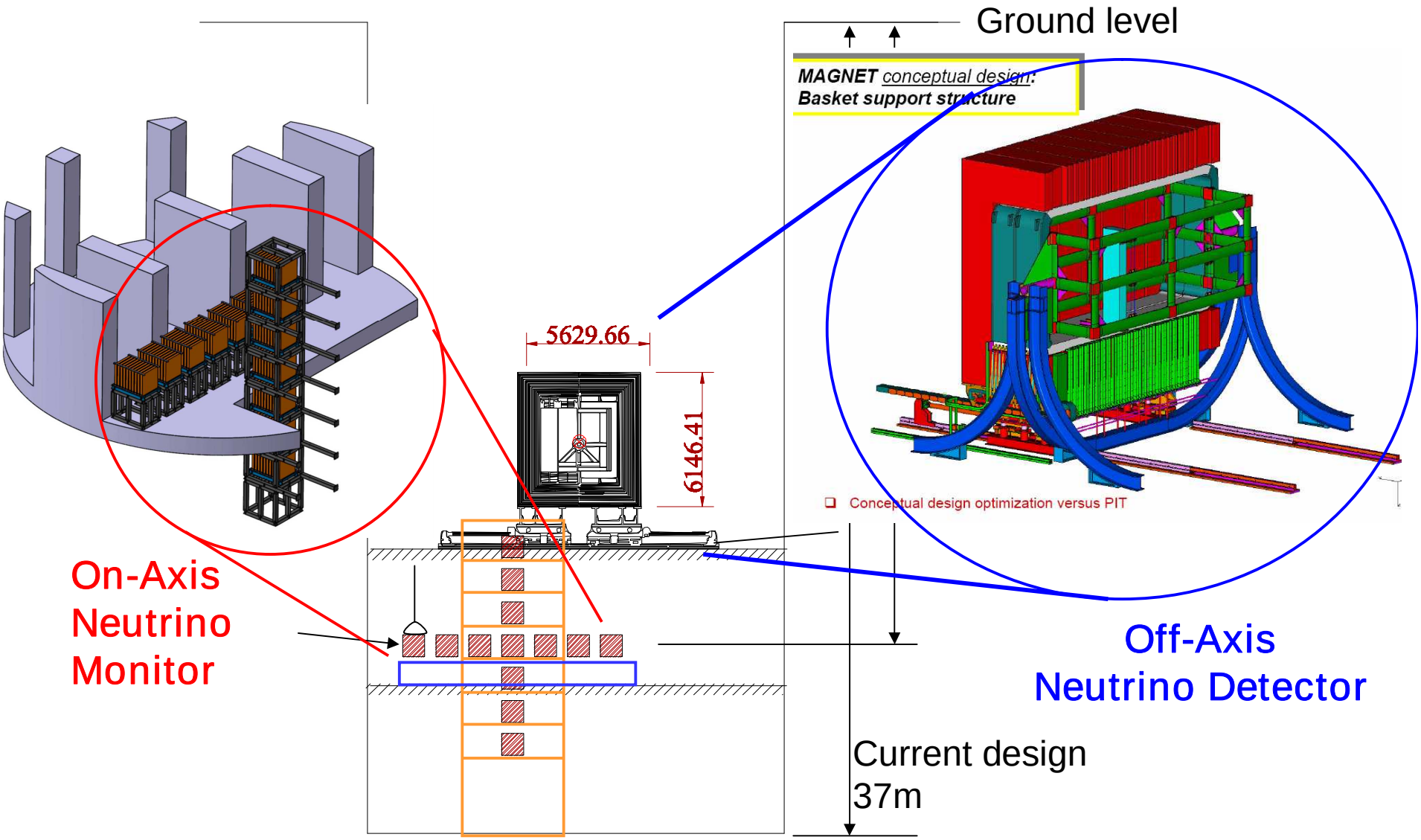


Horns

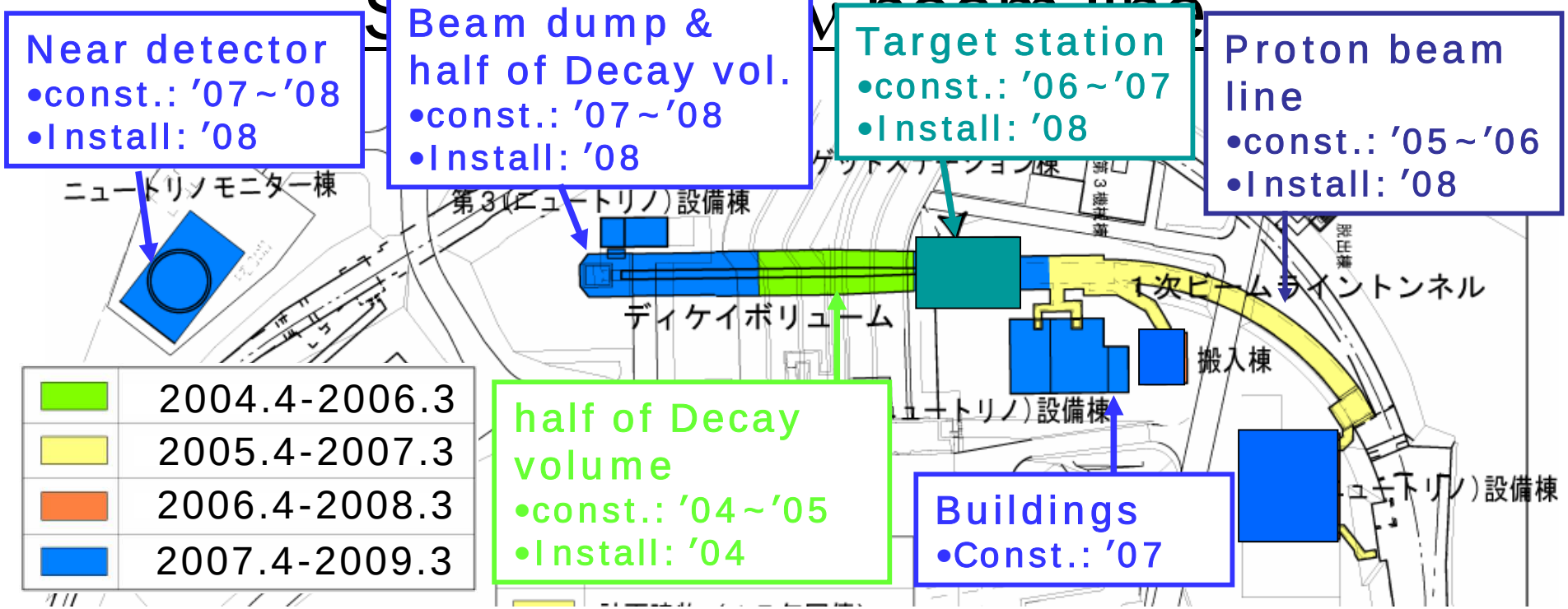


- 1st horn
  - Successful operation at 320kA
  - Long-term current operation test
- 2nd horn design / 3rd horn prototype in FY06
- Support module
  - Conceptual design done on
    - Remote coupling of horns and water / He pipes.
    - Kinematic alignment system
  - R&D
    - Remote coupling of strip-lines
    - Water circulation system (7m pumping up)
    - Support module itself
- Produce everything in FY2007

ND280 Neutrino Detector
(Experimental Hall with 3 floors)



Schedule of new beam line



		2004				2005				2006				2007				2008				2009
		1st yr				2nd yr				3rd yr				4th yr				Last yr				H21
		4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1	4	7	1
Facility Design																								
Primary	Primary line tunnel																							
	NC mags (Prep. Sect.)													Inst.										
	SC/NC in FF																	Inst.			Comm.			
	Cryogenics																	Inst.						
Secondary	TS civil/building																							
	Equipments in TS																	Inst./Test ope.						
	Decay volume		Civil											Civil				Inst.						
	Beam dump													Civil				Inst.						
	Neutrino monitor													Civil				mag inst			Inst.			

Japanese funding situation

Beamline, detector hall civil (~80-oku¥)
Equipments (~72-oku¥)
Proton, muon, neutrino monitor (~ 4-oku¥)

Foreign Contributions

~20M$

from

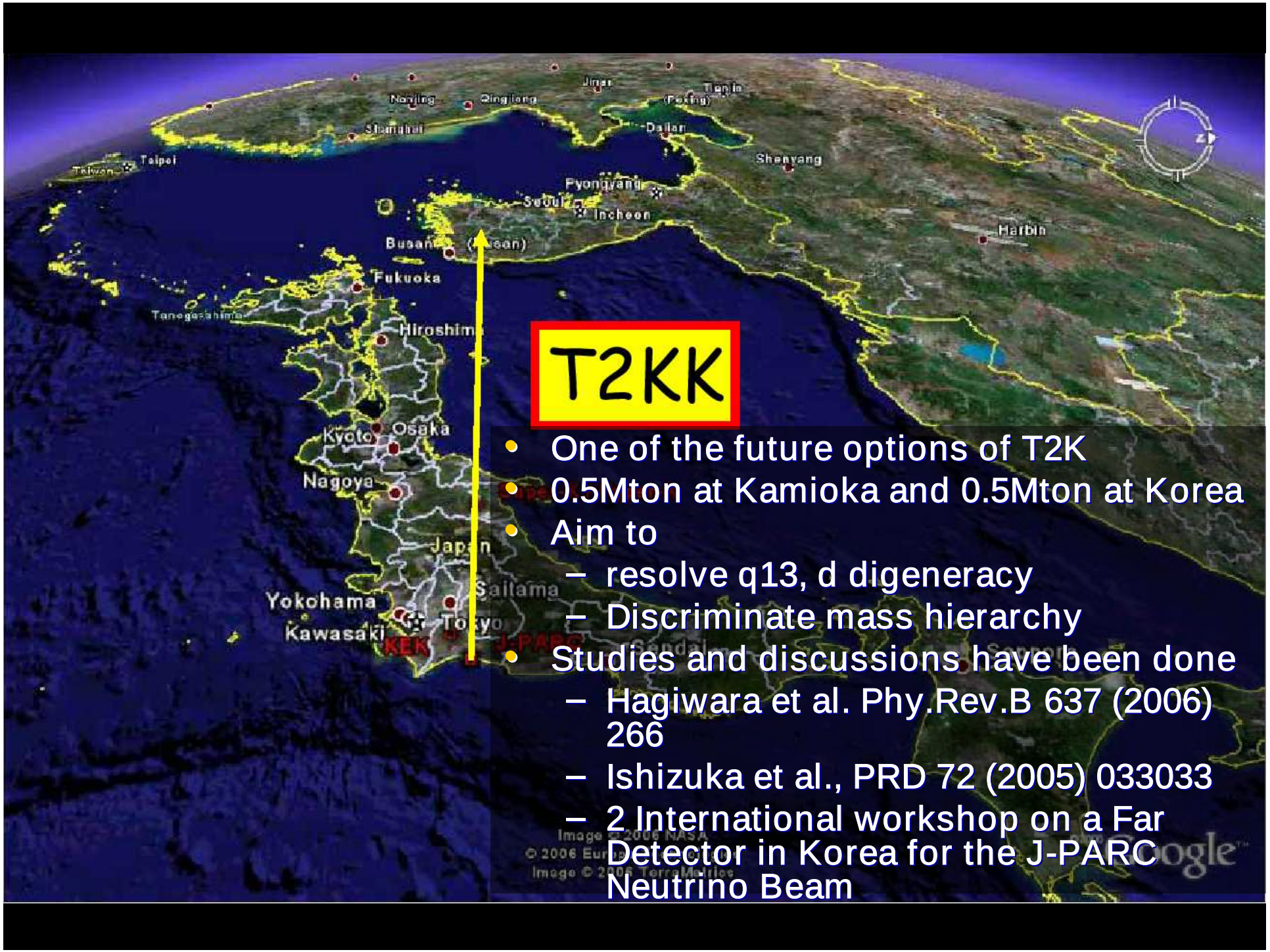
Canada, France, Italy, Korea, Poland,
Russia, Spain, Switzerland, UK, USA

T2K Collaboration

- 11 Countries (number of members)
  - –Canada(24), France(8), Italy(11), Japan(46), Korea(9), Poland(1), Russia(8), Spain(12), Switzerland(3), UK(25), USA(42)
  - –58 Institutes, 189 Ph.D. members, still growing

- Canada
  - Damper system, OTR beam monitor, Remote handling, Actuator, Vacuum chamber, Fine-Grained-Detector (FGD), TPC
- France
  - SC quench detection system, TPC electronics, TPC
- Italy
  - UA1 magnet, Side-Muon-Ranger (SMRD), 2km ND
- Korea
  - Beam Monitor electronics, neutrino monitor,
- Poland
  - Neutrino MC
- Russia
  - Neutrino Monitor, Photo-sensor, SMRD,
- Spain
  - UA1 magnet, TPC, software
- Switzerland
  - UA1 magnet, TPC, neutrino monitor
- UK
  - Target, target remote handling, Dump, Beam window, UA1 magnet, Electromagnetic Calorimeter, Basket, Electronics, Photo-sensor
- USA
  - SC correction magnets, 2nd horn, CT beam monitor, beam monitor electronics, GPS system, pi-zero detector (P0D), SMRD, 2km ND, Super-K

(1)Accelerator (2) Beam Line, (3) Near Neutrino Detector, (4) Super-K


Nanjing
Qingdao
Jinan
Tianjin
(Peking)
Shanghai
Dalian
Taipei
Taiwan
Shenyang
Pyongyang
Seoul
Incheon
Harbin
Busan
(Pusan)
Fukuoka
Tanegashima
Hiroshima
Kyoto
Osaka
Nagoya
Japan
Saitama
Yokohama
Kawasaki
Tokyo
KEK
J-PARC
T2KK
• One of the future options of T2K
• 0.5Mton at Kamioka and 0.5Mton at Korea
• Aim to
– resolve q13, d digeneracy
– Discriminate mass hierarchy
• Studies and discussions have been done
– Hagiwara et al. Phy.Rev.B 637 (2006) 266
– Ishizuka et al., PRD 72 (2005) 033033
– 2 International workshop on a Far Detector in Korea for the J-PARC Neutrino Beam
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