Overview of the AAA activities

March 16, 2021

Masanori Matsuoka
Secretary General, Advance Accelerator Association promoting science & technology

Contents

Contents

Introduction

- **AAA promotes the ILC in collaboration with politician, academia, industry and the local business community.**
- **Due to the influence of COVID-19, our activities have been restricted but we conducted some remote meetings in order to proceed our study.**

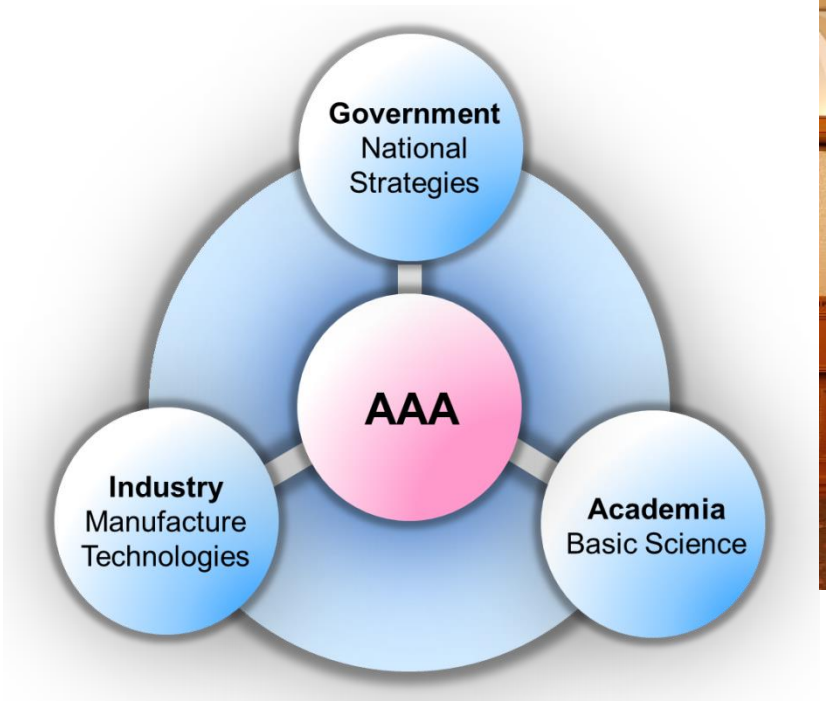


Photo of the AAA general meeting in 2019.
Diet member, Kawamura and Shionoya addressed for AAA members.

Organization

Eternity Supreme Advisor
The late Kaoru Yosano

Honorary Chair
The late Masatoshi Koshiba

Representative Director
Takashi Nishioka (MHI)
Director
Atsuto Suzuki (Iwate Pref. Univ.)
Masanori Yamauchi (KEK)
Yuzo Onishi (Kyoto Univ.)
Masahiro Inagaki (Kyocera)
Mamoru Hatazawa (Toshiba)
Hidetoshi Takehara (Hitachi)
Noriyuki Takazawa (MELCO)
Kunihisa Yamura
(Iwate Chambers of Commerce)
Auditor
Sachio Komamiya (Waseda Univ.)

Supreme Advisor:
Takeo Kawamura
Special Advisor:
Hiroya Masuda
Hiroaki Takahashi
Senior Advisor:
Yoichi Tao
Junichi Nishiyama
Masao Ninomiya
Toshiyuki Sakamoto

Chair: Takashi Nishioka
Vice Chair: Atsuto Suzuki

General Meeting
Corporate Organizations
and Institutional Organizations

Secretary General
Masanori Matsuoka

Technology Study Gr.
Leader: Hitoshi Hayano

Outreach Gr.
Leader: Hiroyuki Yoshizumi

Project Promotion Study Gr.
Leader: Satoru Yamashita

Contents

Highlights of 2020

Technology study group

- We could not hold the technology study group meeting last year but we supported some events hosted by the local community.
- We are planning some meetings by remote in order to discuss the technical issue for the ILC realization.

Outreach group

- We focused on the website renovation in 2020. We are making the webpage as the ILC portal site of Japan in collaboration with academia and local business community.

Project promotion study group

- We studied the following civil issues regarding the ILC by means of remote meetings.

1) Regional Revitalization and Community Development
2) Safety and Disaster Prevention

1) Regional Revitalization and Community Development

done by Project Promotion Study Group

Basic Policy for Community Development around ILC

2021 | 2025 ILC construction start | 2035 ILC operation start | 2050・・・2085・・・

START → **Action Plan** → **GOAL** **Vision2035**

Envisioning the future when the ILC is operational

Basic issues to be considered

- Energy Sustainability
- Innovations in Mobility
- Advanced Information infrastructure
- Knowledge Transfer
- Healthcare and Education
- Area Management

On behalf of the Regional Revitalization and Community Development Working Group of AAA Project Promotion Study Group

岩手県 Iwate Prefecture / 東北大学 TOHOKU UNIVERSITY / 岩手大学 IWATE UNIVERSITY / 岩手県立大学 Iwate Prefectural University / OBAYASHI / 飛島 / NTTファシリティーズ / 三井住友建設 / 株式会社 福山コンサルタント FUKUYAMA CONSULTANTS CO.,LTD / NTT東日本 / 西松建設 / 株式会社 復建技術コンサルタント Fukken Gijyutsu Consultants Co.,Ltd. / 高砂熱学 / KYOCERA / アジア航測株式会社 / TAKENAKA / 東急建設 / 株式会社 都市計画設計研究所 / Pacific Consultants / 三井共同建設コンサルタント株式会社 / YAMASHITA SEKKEI INC. / 株式会社 低炭素化研究所

Theme of "next generation town development when the ILC is operational"

Vision2035

Set up a special national strategy zone.

- **Knowledge transfer**

Tohoku ILC Eco-system

- **Mobility**

Autonomous driving / eVTOL special zone

- **Green ILC / Energy Sustainability**

Next-generation agricultural, forestry, and fisheries bases utilizing ILC waste heat and other sustainable energy sources

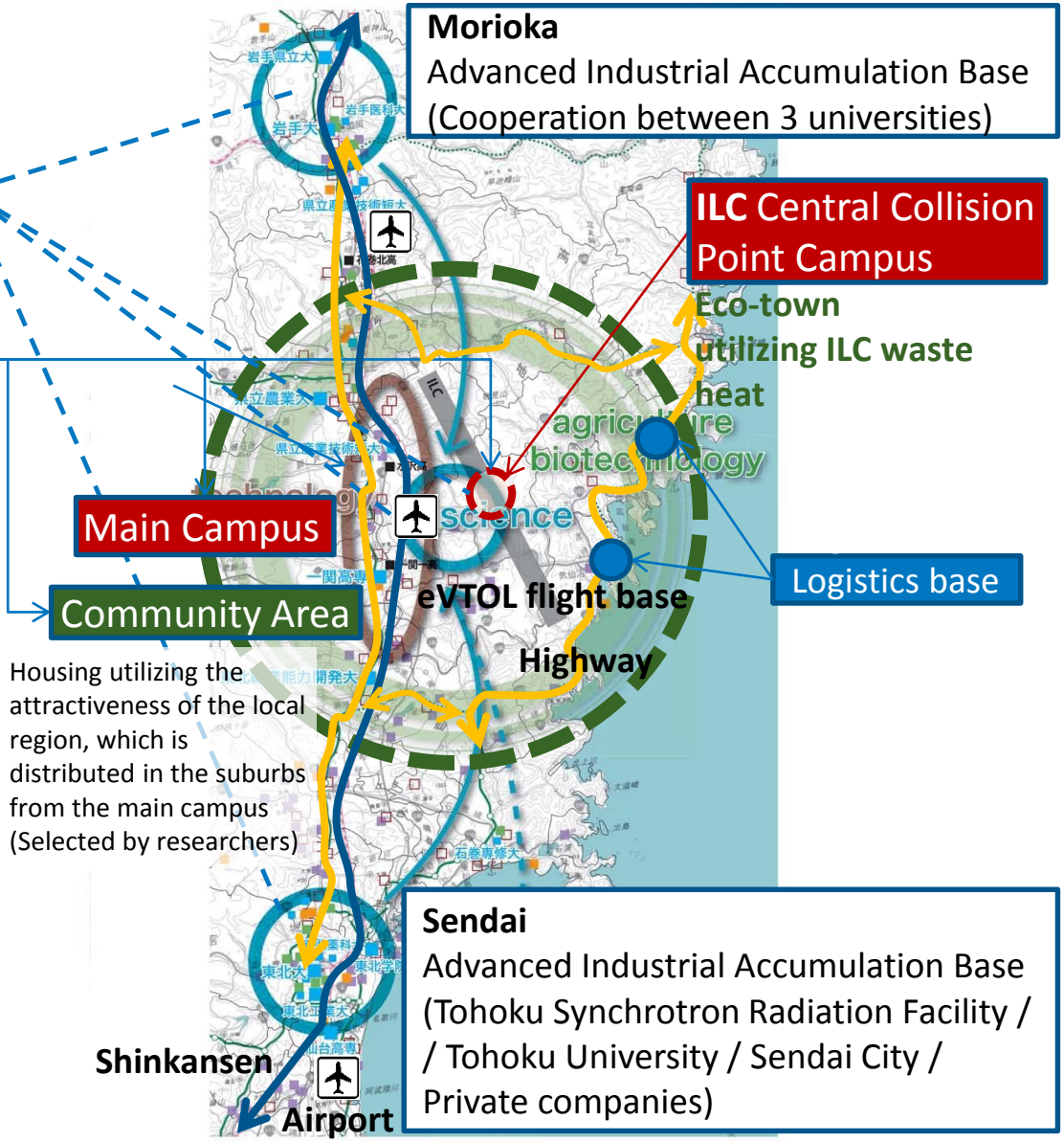
- **Advanced Communication Infrastructure**

- **Healthcare/Education**

Internationalization and ICT

- **Accommodation / Residence**

Albergo Difuso ⇒ Accommodation-type tourism town development that makes the best use of local resources



Reference Information: "Tohoku and Kitakami Area Grand Design with ILC"

Basic model of ILC community (setting design codes)

Vision2035

Sustainable community development that coexists with forests and nature

- Community of appropriate size (200-300 units)
- All wooden
- Green garden community

● Town Center
- Commercial facility
- Hotel
- Business center

● Local production and local consumption of energy

■ 4th generation district heat supply
- Solar heat plan
- Unused biomass heat use
- Unused waste heat recovery

Wooden Residence

Greenbelt and Agricultural complex

Large scale heat storage

Central green park
Sports Facilities
Square and Marche
Child facilities
Restaurants
Hotel

Main road

Old city Area (local community)
- Efforts to foster exchange between communities
- Improve regional brands in the old city

Evolving City Planning for the Next Generation

● Growth management of community
(Returning development profits to the community)

● Incorporate cutting-edge technologies
(Society 5.0/ICT・AI)
- Healthcare
- Mobility
- Robot service / guidance

Areas where ILC-related companies, medical care, education, robotics, AI technology, etc. are concentrated

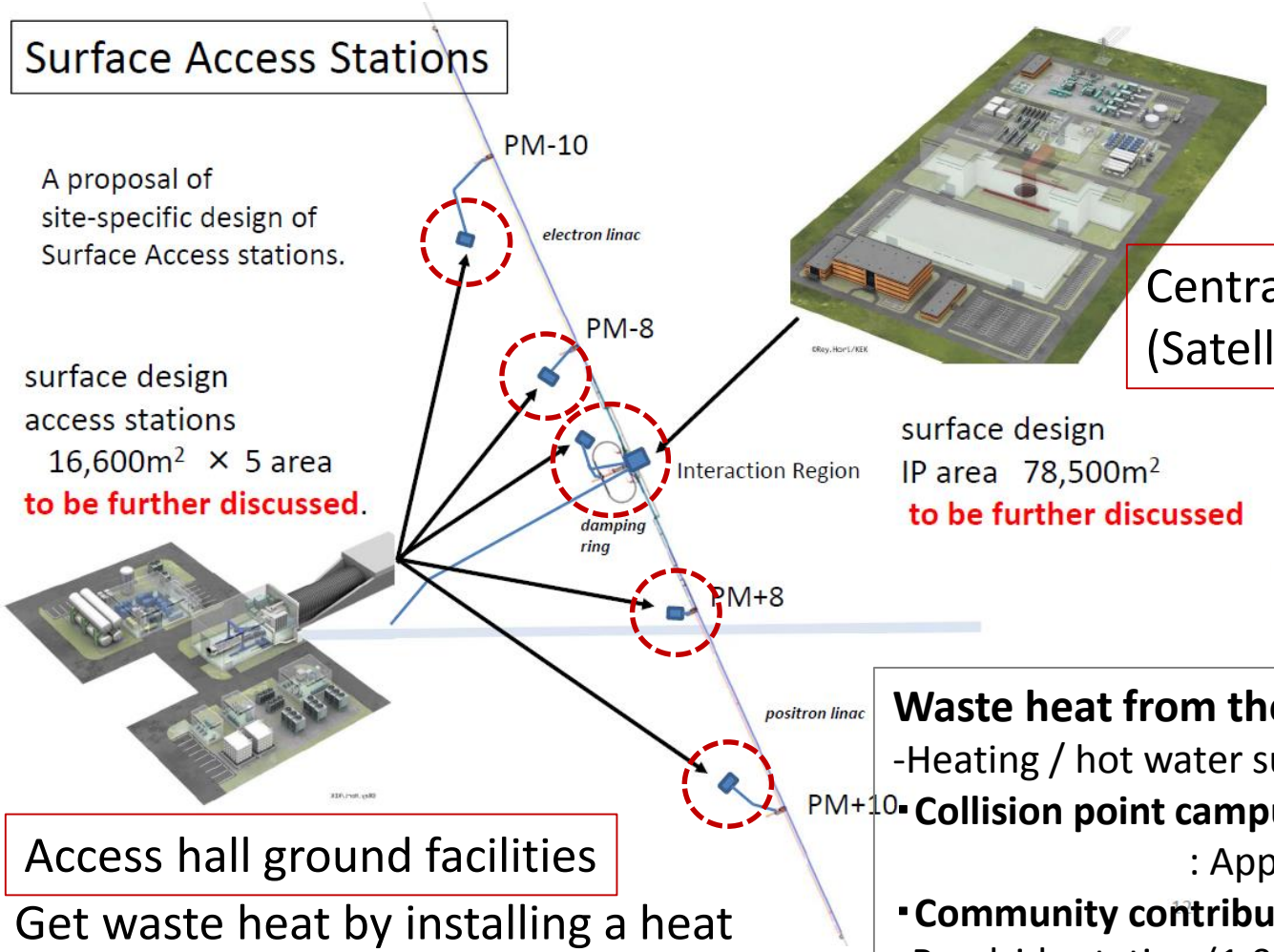
■ Next generation mobility area
- Fully automatic operation (Level 4 or more)
- eVTOL takeoff and landing
- Seamless transportation and logistics
- People flow / logistics interlocking service

Use of waste heat from the ILC central collision point and tunnel entrance (access hole)

Surface Access Stations

A proposal of
site-specific design of
Surface Access stations.

surface design
access stations
16,600m^2 × 5 area
to be further discussed.



Central Collision Point Campus (Satellite campus)

surface design
IP area 78,500m^2
to be further discussed

Access hall ground facilities

Get waste heat by installing a heat exchanger at the tunnel entrance (access hall) ground facility

Waste heat from the ILC central collision point

-Heating / hot water supply-

- **Collision point campus facility**
  : Approximately 1,700 MWh / year
- **Community contribution facilities**
  Roadside station (1,000 m2) 67MWh / year
  Spa facilities (2,000 m2) 1,200MWh / year
  Agricultural facility (150,000㎡) 28,800MWh / year

→ farm house about 750 buildings worth equivalent

NTTファシリティーズ 高砂熱学

ILC Central Collision Point-Eco Campus Concept utilizing Waste Heat

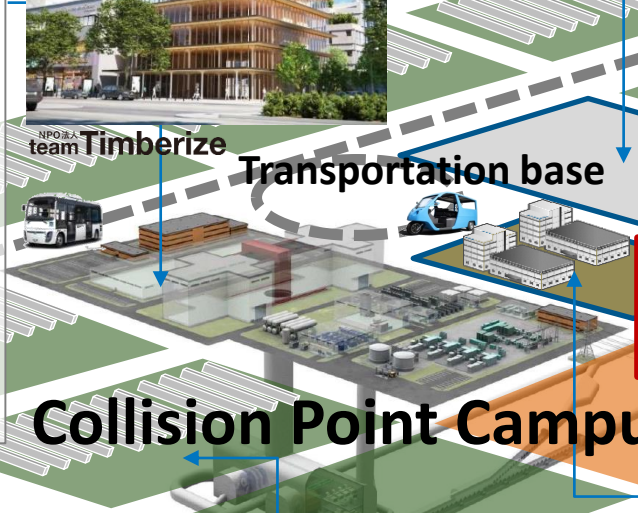
Vision2035

Agricultural land around the collision point will be consolidated and developed as a production base that supplies waste heat from the ILC to attract agricultural production corporations and land-based aquaculture companies. Also used as a wood drying and wood chip drying supply base

Collision Point Campus (wooden construction)

- On-site research office
- Control facility
- Experiment, maintenance, work facility
- Energy center (Power supply, air cooling equipment)

NPO法人 team Timberize



- Spa
- Community Site
- Roadside Station

Energy center with large scale thermal storage tank

Wood drying / Processing Woody biomass collection base

Agricultural house / plant factory

Land aquaculture

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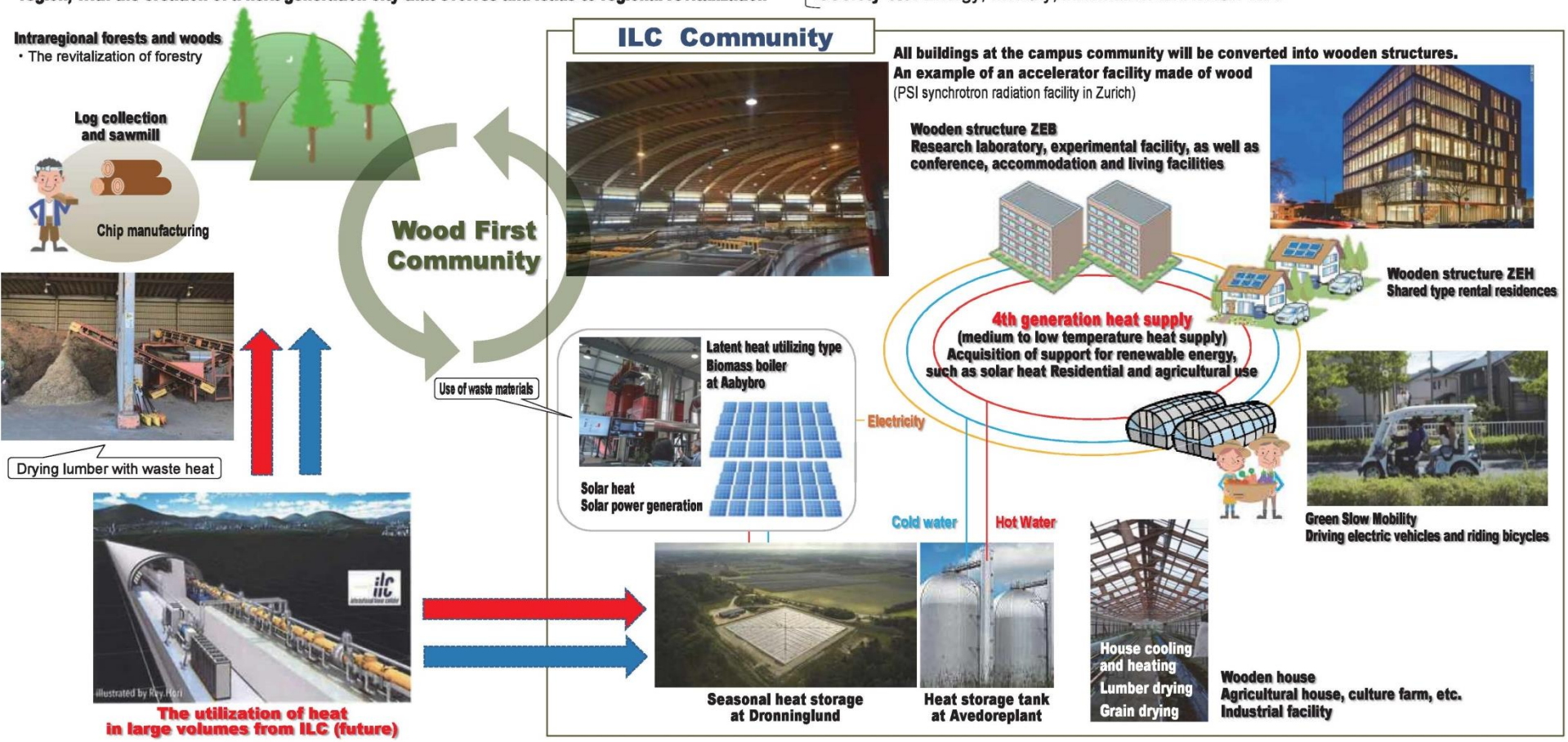
Forest and heat link the ILC with the region

- **The recycling society of forest and heat activates regional industries**
- **The establishment of the ILC is considered as an opportunity to resolve various issues of the region, with the creation of a next-generation city that evolves and leads to regional revitalization**

Wood First: Erecting buildings entirely with wood and utilizing waste material biomass
Zero Emissions: Maximizing renewable energy in the community
Society 5.0: Energy, mobility, information and health care



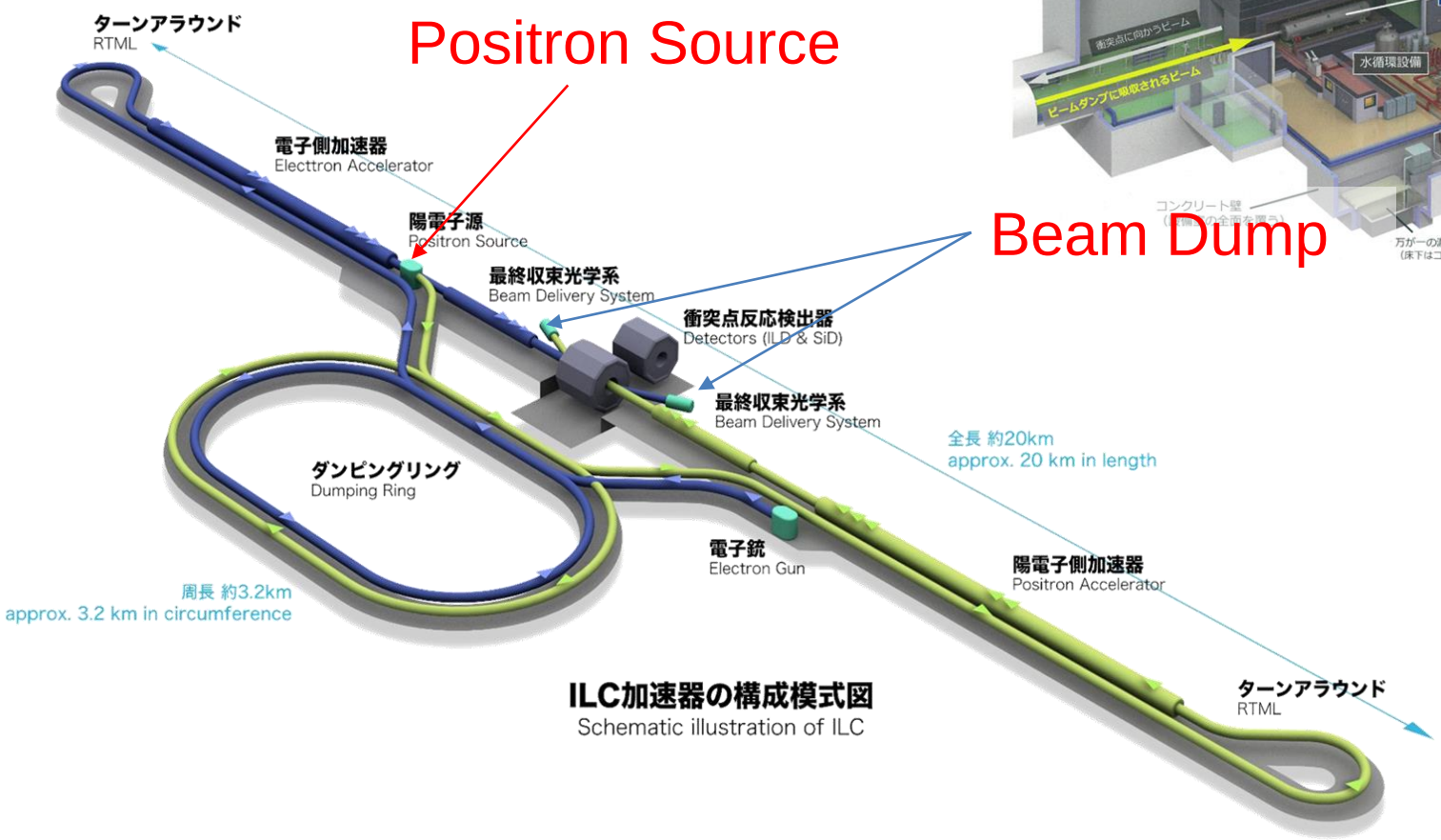
Regional Revitalization and Community Development Work Group, Project Promotion Study Group of AAA.

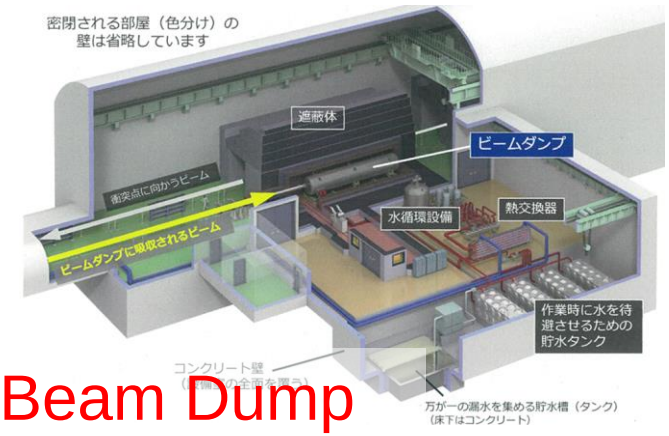
2) Safety and Disaster Prevention

done by Project Promotion Study Group

High radiation facilities of the ILC

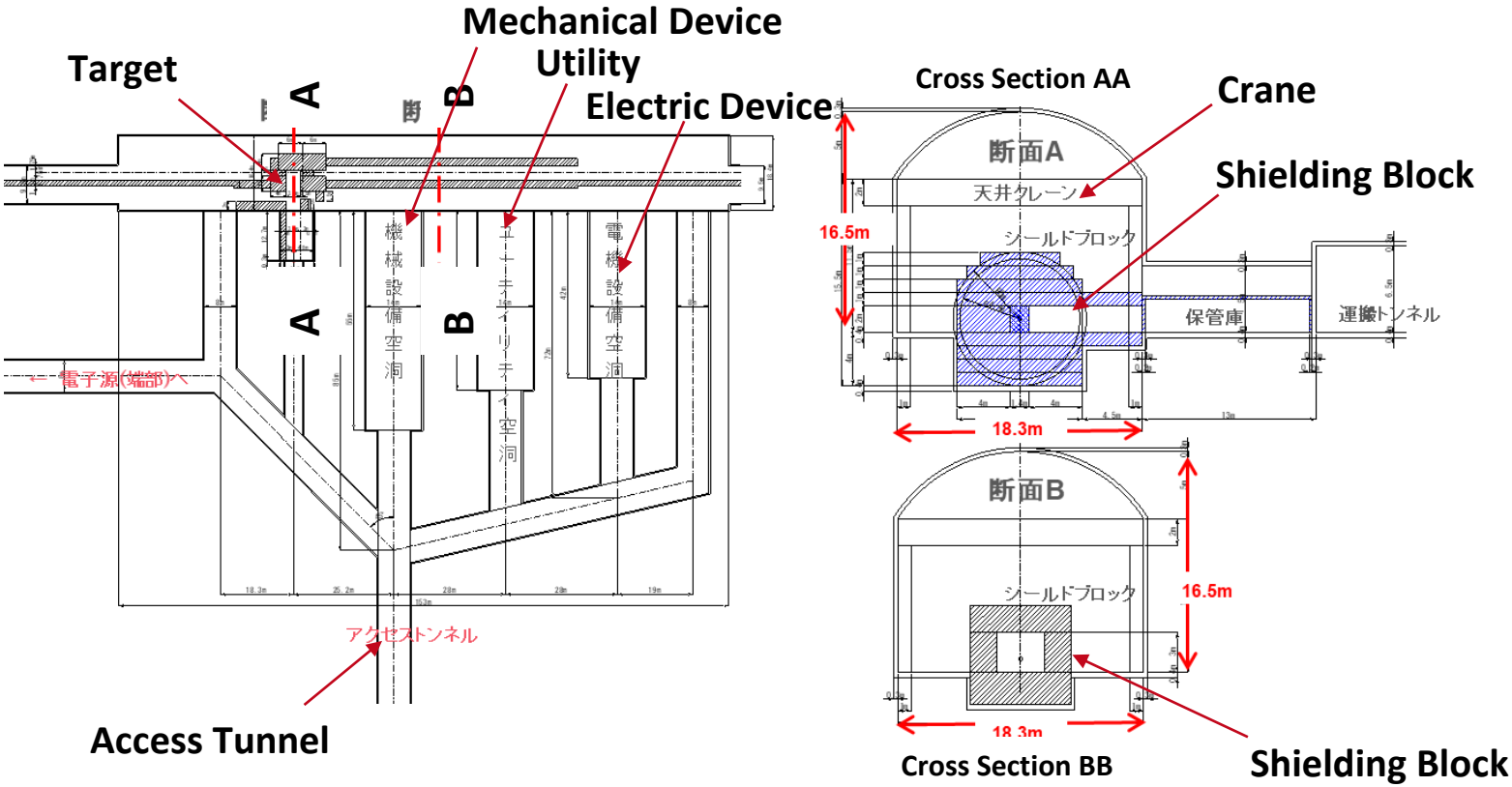
- **Beam Dump and Positron Source are high radiation facilities and needed to study the appropriate structures for setting and handling safe radiation shieldings.**





Positron Source

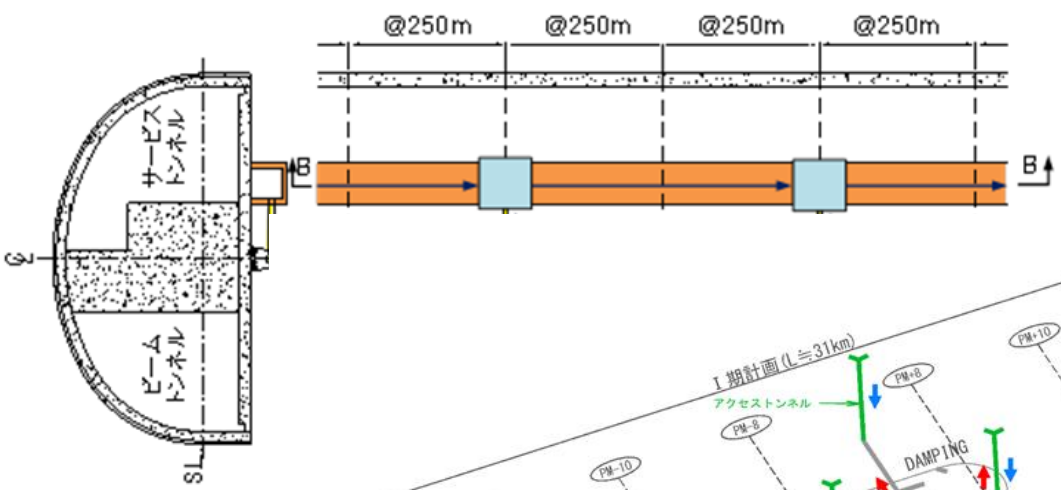
- **Two schemes of Positron Source have been proposed.**
  1) **Undulator scheme** (Shield : 0.75m iron and 0.5m boronized concrete)
  2) **Electron-driven scheme** (Shield : 0.75m iron and 2.6m boronized concrete)
- **The underground cavity structures for an electron-driven scheme case which is more critical in point of radiation, has been studied.**

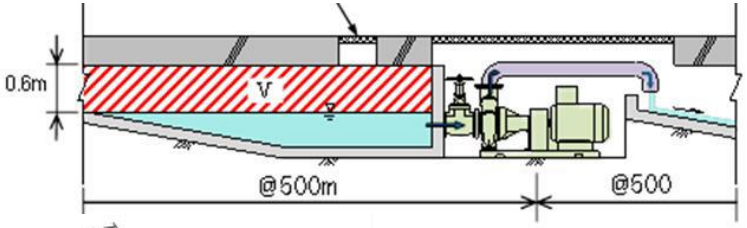


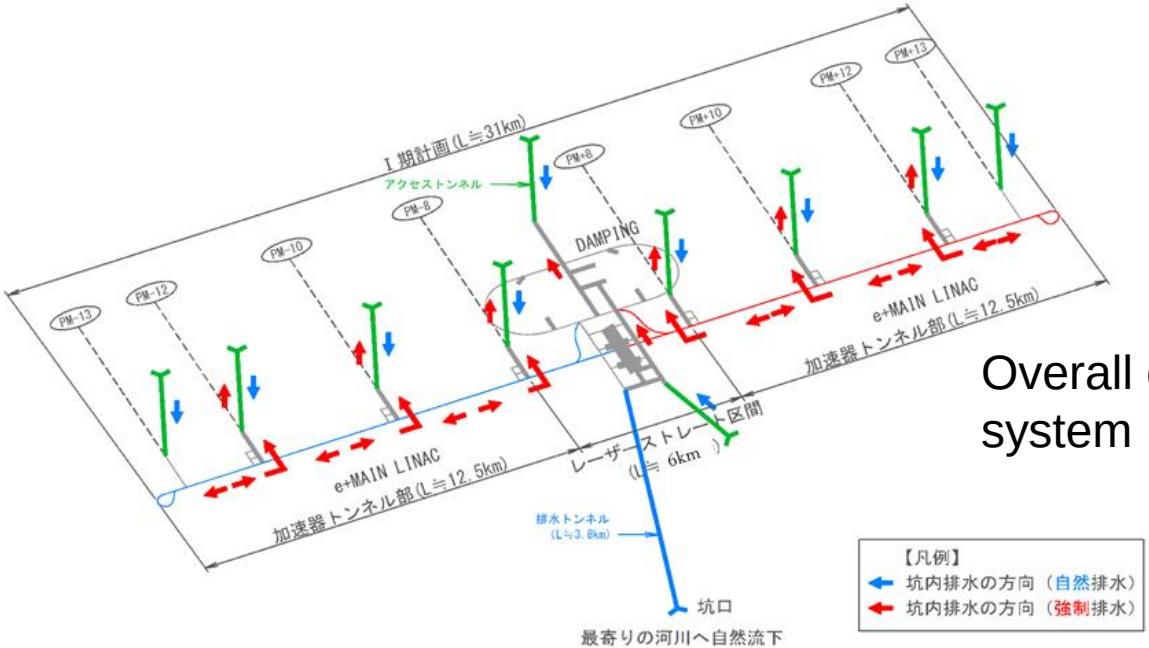
Drainage System in ILC Tunnel

- **Longitudinal gradient of accelerator tunnel is parallel to geoid, meaning almost no natural flow down**
- **Pumping to near access hole and pumping up to access tunnel entrance in normal time (electric power supply)**

System of drainage and flow conducting



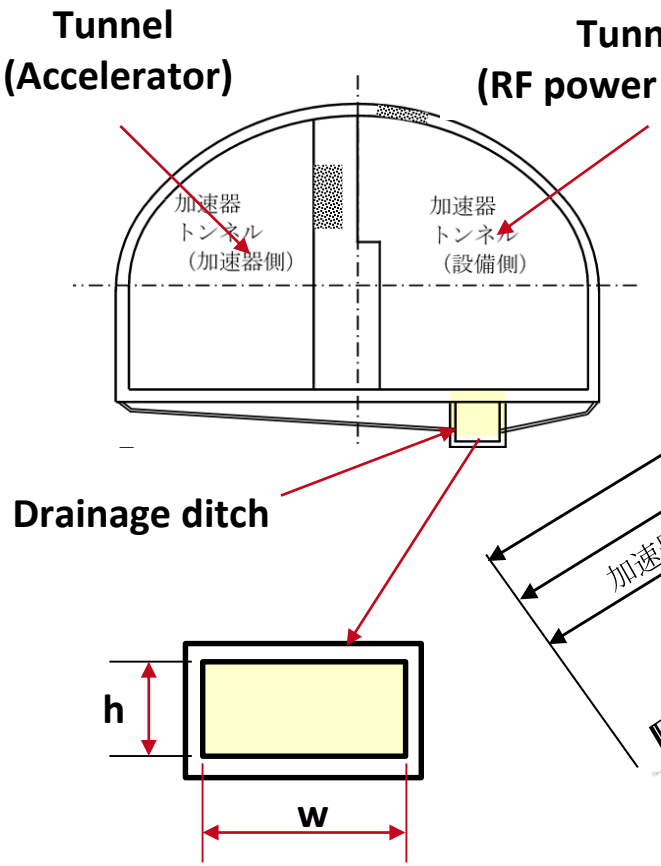


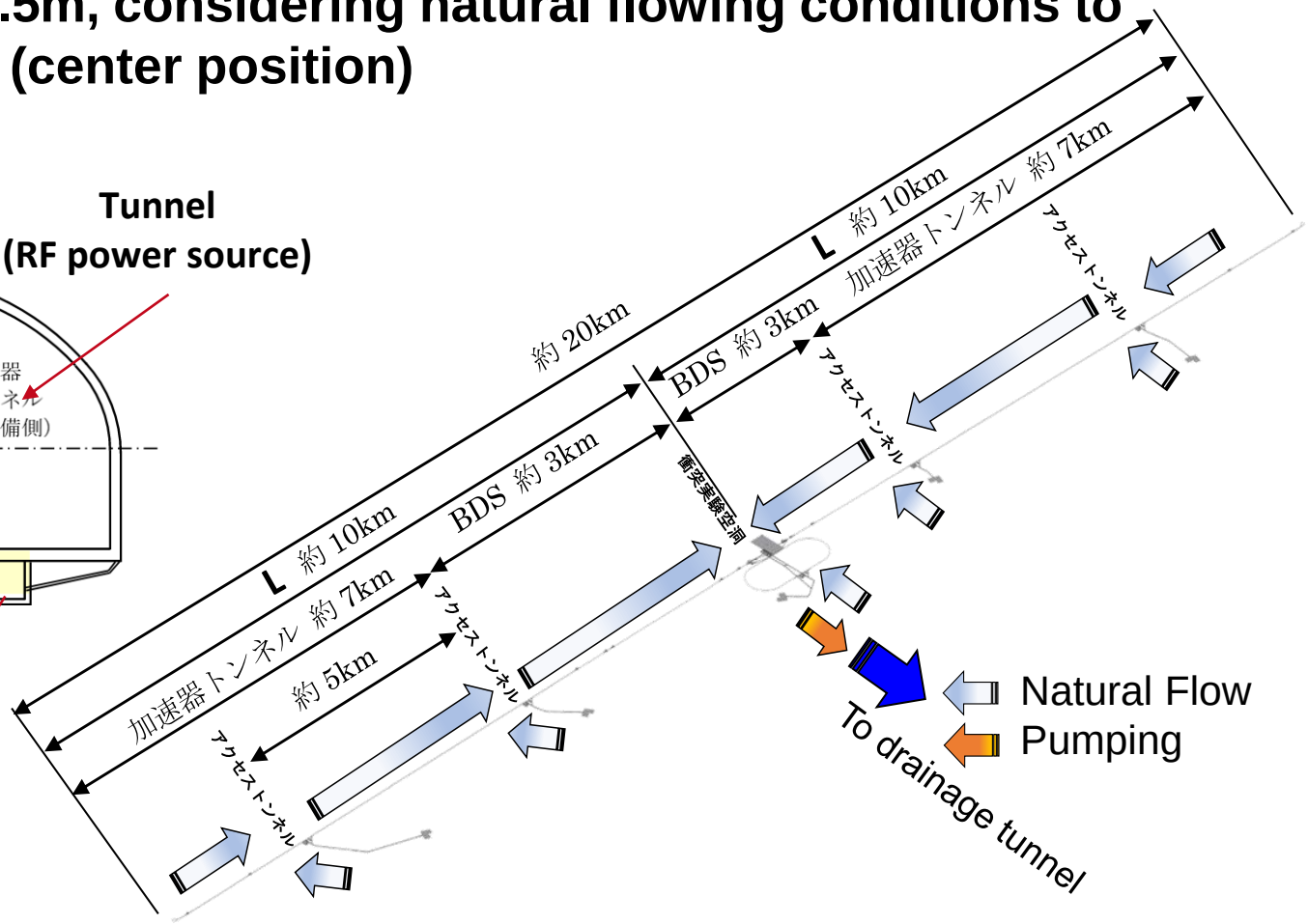


Overall drainage system (normal time)

Drainage System in ILC Tunnel

- **In emergency time (no power supply), the depth of water flow ditch should be h=0.51m（L=10km）or 1.06m（L=25km）in case of ditch width w=1.5m, considering natural flowing conditions to drainage tunnel (center position)**





Overall drainage system (emergency time, no power supply)

Contents

Conclusion

- AAA continue to contribute to the ILC promotion in collaboration with politician, academia and local business community.
- We are planning to hold events in order to get the understanding from variety area of private companies and appeal to the government.