## Tomb Mounds for Requiem

#### ©Ben Nakamura

•Shore Scape for the Requiem **"Disaster Wave to the Hope Wave"** 

arphi $\chi$  "Requiem for the Spirits of the People, still

**"Take Energy from the Nuclear Polluted Sea"** to the Requiem by making the Mounds by the Disaster Waste.

floating in the sea, after Tsunami's drawn out"

Each mound can be made by the International Donation, 20m high, 300m wide, waving mounds

•Souma- Futaba Area: 1,303 death +21 lost

•Souma- Futaba Area had many ancient Tomb Mounds in 3~6 century.

·Wind Power generation on the Sea wall

• Medium Wave Power plants on the 5m shore

• Big Wave Power Plant on the off shore line, Ocean Wind Power Plants on the 30km

A Recovery Plan for Fukushima 2014 by Natural / Renewable Energy 140729

## ---低炭素型理想都市の研究から東日本大震災復興への提言---

#### Ben Nakamura

Architect, Planner, JIA Professor, Kogakuin University Chairman, JIA Environmental Action Lab. Chairman, AIJ Special Committee for Low Carbon Society

•FINAL TARGET : To create the most Sustainable City and most Respectable Society of the World, by creating the Low Carbon, Recyclic and Multi Biodiversity Society.

#### 2-1 Principle

1 Purpose

• To give hope to the escaped People to be back home in the future.

•To present the value of the land to the villagers, being evacuated long period, in order to give them peace of mind and economy.

• To break through from the Nuclear and Fossil Energy.

•To Break through from the normal living standard.

• Every waste materials, disaster rubbles, living waste, energy and thermal abolition, will be recycled as treasures.

Air; Wind, Light; Photo voltaic energy, Heat; Solar heat

Timber; Forest Timber, Forest Waist, Construction Timber, Disaster Waist Timber Water; Rain Water, Pond, River, Sea, and Wave

Waist; Home Waist, Industrial Waste, Agricultural, Cattle farming Waste, Sewage etc. Ground Source Heat; Hot Spring Water, Water, Circulation Water drawing heat

• To Create splendid society for the village people to be a leading character and live with their own pride.

to hold their history more valuable, to love the nature, to bereave their community friends, people, and to help, give, share with the family of the community.

## Basic Concept for Ideal Environmental City

Creating sharing communities and self-reliant resilient settlements, circulatory and open-ended, appropriate for the low-carbon shrinking-population are, where local characteristics are charished.



() Accept varies 3 combinities a constraint second diversion for grantee the son of continuous growth and deep content in give the to or its private varies (in the constraint) we leave a the son second second

2) Aim for and error is and buildings that are self reflect and obtained the state scale of an evaluation of the obtained surroundings while having open systems connected to the conducted.

30 Ase reflerious il estates with low COs on insterio fluctions, importante to local charactery, deutry and histority.

4) Think also interval energy supple and quts taken they indire with systems based in the vicinity such as referenced picture of eq. for each had a second as a spectre wathout.

e) Solis e e la processario e final lessors a borne el non dan les andre tratas restrictors cabesen va destal andre ming la rice e, la clava de cher espectago el regent regenter unar berrig provide.

(c) Switch from individual on no sharing easing: from Leng alone loss variety of households, making multi-generations metastrongent sectors to straing that be.

\*) Consists a sensity of only the extention provention in section of the lower planning and management level, both "welf and "regists are indexed a thermitia wailing as we in a planning section of the section of the section."



#### 2 Proposal

1. To Propose 3 term recovery plan for Short(3y), Medium(10y), Long(20y).

2-1. Short term plan for Tsunami sea water covered area, to recover supply water and drainage water channel and pump stations for 3 years.

2-2. Short term plan for the preparation of the methods and system of Dis-contamination of the Radioactivity for 3 years.

2-3. Short term plan for the temporary Housing and to develop the preparation estates, and to recover East-West road network for 3 years.

3. Medium term plan for the recovery of the regional economy, by industrialization of the natural and renewable energy and the recover activity.

4. Long term plan for the land use of radiation contamination area, to convert to Biomass Agriculture Field and/or Natural and Renewable Energy Plant, with Smart Energy Grid System.

5. Biomass Power Plant to use Biomass Agri-Products and/or Urban Waste, converted from existing Thermal Power Plant and Nuclear power generation system, or to construct dispersed medium size power plant in the area of between30 ~50km.

6. Wind Power Plants on the hilly area and on the shore

**Fukushima** Confer



## A Recovery Plan for Fukushima 2011 by Natural / Renewable Energy Louise Field A,B: Solar Power Plant (123) 1km2=5MW B,C: Biomass Power Plant(Ex. Nuclear and 6) thermal power generation) B,C: Biomass Agri-Field Biomass dispersed (80) BDF Bio-Diesel Fuel Plant Waste Recycle Power Plant W: Wind Power Plant (17)Hydroelectric Power Plant Wave Activated Power Plant D, Recovery Preparation Estate (45)D-1, Recovery Housing Community (27)D-2, Recovery Industry Estate International Renewable Energy Center 20km inio to Monato Tanji to Kunan 30km 40km @Ben Nakamura



Report from Fukushima 2014 Seamen missed their sea, Farmers missed their land, Merchants missed their market, not by their own will. Families separated in several houses, Communities separated in some areas.

Still130,000 people lived apart from home. Still Namie Town/ shore area clean up. Still many people lived in emergency house. Government only manage their wills.

## Report from Fukushima 2014



Government only manage their wills. Government construct sea walls, public sector buildings, fishermen's' markets, irrigation, infrastructural facilities.

Many constructional demand increased, the development babble occurred.

The construction cost has been higher, lack of workers, rejection new work, etc.

Recover housing development started in public, very few in private houses.

Because of their lost/ smelled property by Tsunami and Nuclear Accident.



## Recovery Development Scheme People's Participation by work, things, money and wisdom

• Development Managing Council to be organized, distributing the individual benefit from the energy development to public for every people, in order to encourage the Local Economy, and to avoid to make any meaningless disparity.

•The Council evaluate the proposals from the SPCs of projects, adopt the SPC which will contribute to make equity for people. To execute the projects, step by step with confirmation of the value on the process.



 Classical
 <thClasical</th>
 <thClasical</th>
 <thCla

11,March 2011, Tsunami attacked and Plant Stopped by emergency electricity stopped. Melt down of the core happened and hydrogen burst destroyed No,1,2,3,4 plants.

before

In 2014, many tanks are set on the hills. Nuclear contamination water is most difficult, 360,000tons stocked, 400tons/d increasing 30m Ice bar walls will be put around the plants (1500m) 30~40years needed to finish

## ①Recover Living Standard The Proposal for the Traceability of the materials To secure the safety from the rumore reputation of the radioactivity

201

To use the system of the timber traceability system to the every skeptical materials, food, waste and everything.

Every elementary schools have the checking system and make it by the request of the people.
 To put the electrical tags or bar-cords to the materials in the process of the transportation.
 These monitoring will be done at the municipality, university, Hospital and the research center, and to publish them for the mutual supervision.



## ①Recover Living Standard2 Plan for the Central Town Area



\* 全統 \* 1 The 70,000 population of Minamisoma will be shrinking to 45,700 to32,500, which \* 3月前父で \* is almost 65 to46%.

● F分式 ■We have to plan for approx. 45,000 city, not for 70,000 city.

 It will need the Compact City reformation with economical and financial plan. Three Districts, Haramachi, Kashima and Odaka, will be the centers for the activity.
 The area is restricted in 2km diameter, in Haramachi and Kashima district, and 500m in Odaka District, where, 15,000 to 25,000 city will be planned.

The City center has been osteoporosis in the urban diagnosis for its vacant situation. We propose to introduce the Walking, Bicycling and Demand Bas System in the

center, and strengthen Educational, Cultural, Welfare and Medical functions, with its Historical Features, rather than Commercial activities.



 The conversion from the right of the land ownership to the right of the land use will be planned, for making more fluid and vitalize the economy and peoples' activities.

The medium size housings will be constructed for the elderly and young family, and to grow the population in the center/

Commercial facilities are gathered along the by-pass road, the neighbor hood commercial and communication spaces for the central area. Buildings are kept the Basic Environmental Quality for the Zero- Emission buildings. Community Living with dining and bath with

Central area of Haramachi District., many vacant houses and lands are observed.

multi-generation is based to help each other.

## Proposal for the recover infra-structure, East-West road and Recovery Preparation Estate



## ①Recover Living Standard 4 zero emission quality is needed even for the temporary houses—

The Zero Emission Quality is needed even for the temporary houses

The temporary houses have many problems, such as narrow, they are wasted after2years life, low quality of the environmental conscious, etc.

■ I propose prefabricated Rack-Joint Method System, which is dismantled smoothly after the role of the temporary houses, and reconstruct for the second story houses with double materials.

■ It has a high performance quality of the basic environment with low energy consumption.







■システムエコ住宅の概要









# ① Recovering the Community Living LOW COST ECO-HOUSE DEVELOPMENT PROJECT At Minami-soma, Toyama, Osaka, Chiba and Toyoda city

Thick insulation on the outside walls and roofs, with double glazing wooden sashes, which Ua factor is less than  $0.8W/(m^4K)$  and the total energy consumption per year is less than  $700Mj/y/m^4$ .

Fresh air is coming through under ground pipe and heat exchanged by the waste air under the floor. High efficient (4~6cop) air compressor equipped in the under floor, heighten the intake air, which will make warm the concrete mat slab, and then finally take into the room. These air circulation using the passive method make the heat loss smallest, and to store the heat in the skelton, then the energy consumption to be smallest.









1-1:Power Generating Capacity by

■売電金額と利用電力換算 ・売電価格:20円/kwh ・一般家庭の年間利用電力:4200kwh/年・世帯



Wien, Austria Spitterau Recycling Center, Hundeltwasser 250,000ton/y, urban waste Burning Capacity 2 42.5 MW Steam Production 2 45 >/ (32 bar 240°C) Electric Power Generation max. 5.5 MW Electric Poer Supply max. 1.5 MW District Heat Supply 60 MW Utility Efficiency approx. 74 (Network Energy Selling/Burning Capacity)

XJapan do not manufacture small and medium Power Plant.

Biomass Continuous Carbonizing Plant + Waste Heat Plant work hour 24 /day 300day/y 20.4t/d

exhausted gas 0=9,600 Temperature of Exhausted gas =795°C Calorie =2,500,000kcal/h Electricity Efficiency: 15% 375,000kcal/h=436kw/h



## Guissing, Austria Biomass Power plant

have made the city developing, lower energy cost many industrial company had come together

#### 2 Recovery Plan Natural / Renewable Energy Potential of the Small and Medium size Water Power Plant



#### USA Virginia State Hudson River Mechanicsvill Water Generation Plant generating from 1897 design: Charles Steinmetz power Out Put750kw

Tsuru City, Yamanashi Pref.

©Ben Nakamura

©T. Iida

2050年

- Genki-kun No.1
- Open 2009
- made in Germany Power Out Put 30kw



## 2 Recovery Plan 3 Natural / Renewable Energy Potential of the Mega Solar Power Plant-





### 2 Recovery Plan 3 Natural / Renewable Energy Potential of the Mega Solar Power Plant-

©Ben Nakamura SST

Photovoltaic panels are put above 3m, agriculture and cattle farming can be producible.





() In Japan, Flat lands for normal solar panel on the ground is very small, and competitive with normal land use.

②Normal Solar System needs land fill, cut and dig roots, and leveling the land, the cost for land is high.

The cost for land formation and preparation for disaster is very high Solar Pnels cover and prohibit for the people not to enter, Do you hand your land to the solar panel?

Sky Slar System allows the multiple use with on earth use, park, car

parking, road, fruit farm, pasture field, agri-factory and solar plant above ←

©Ben nakamura

## Cable Type Sky Solar Ben Nakamura and JFE Technos

Carport Type Sky Solar

## CABLE type ケーブルタイプ



First Concept Sketch: Initial idea is started to use undeveloped space above daily activities



 Model Wind Test:
 1/5 Real Material Model Test

 Wind durable test is needed for Typhoon disaster.
 Real Material Model shows the details of Joints and construction method.



Implementation Scheme :



Sky Solar above the hilly slope:



Proposals for A Amusement Park Car Parking Space :

## High Pole Type Sky Solar

HIGH POLE type ハイボールタイブ



High Pole Type Sky Solar above River Flood Control Pond, Kumagaya City



High Pole Type Sky Solar above Car parking , for factory, shopping market, amusement facility, etc.



High Pole Type Sky Solar above River Flood Control Pond, under construction





Chan Nelsanura

©Ben Nakamura and Komai Haltec

CAR PORT type

カーポートタイプ



第二三区建方 現場写真

## ② Recovery Plan 4 Natural / Renewable Energy Potential of Wind Power Plants on the hilly area and in the shore line.—



A Plan for Wind Power lidate Village – Minamisouma City ©Saito, Kawado

Wind Condition : Annual Average Wind Velocity 6.8m/s Steady Wind : WEST good for wind generation energy efficiency : 25 28 (estimate)

Capacity :2,000kW 3,000kW (Large Unit 1) Const. Cost :500 700million yen Annual Generation : approx. 5GWh (1,500 general houses ) Income 100 million yen / y ( yen/kWh FIT)



- Fマーゼル 牧事務制作的

ディー的。 エンジン

### ② Recovery Plan 5 Natural / Renewable Energy Potential of the Ocean Wind and Wave Power Plant—





#### Ocean Energy Power Special Area, Fukushima

- · Off shore distance approx.50km
- · Depth approx.100~200m
- · Area: Width 10km× Length approx.50km
- Area: 50,000ha
- Potential of the Energy Development Ocean Wind (Floating) 5GW Wave Energy 1~5GW (= 3~5 units of Nuclear Power Plants)

#### 4 ©T.Tsuboi Smart Grid System to average the unstable natural and renewabl<u>e energies</u>—

Distributed Autonomous Energy Control System for Fukushima Prefecture

- . Stable Wind Power : Minami Soma City ( 131kW/unit•y)
- . Use Diesel Electric Generation System by natural Gasses for the stability effect.(waki Off Shore Gas fig.1) . Hybrid Generation System with Wind Power and Diesel Engine.(cf: Okinawa, fig.2)

Proposal of Smart Grid Integration

- 1. 福島特区におけるエネルギーの需給バランスシステムの構築による自律できる次世代エネルギー地区の構築の提案。
- 2. 自律エネルギー技術実績技術に基づくハイブリッドシステム提案。(例:南相馬市での風力、ガス田の活用)
- 3. アナログテレビ終了に伴うUHF帯無線を有効活用したICT技術を災害時にも強いモビリティ技術の活用。

#### ■<課題>

- 1. ローカル・スマートグリッド実現に伴う既存配電規約の緩和の検討。(例:電気事業法 第26条、電気事事業施行規則第44条等)
- 2. 福島県における自律分散エネルギーシステム構築に向けた検討。
- 3. 未使用UHF帯(730MHz~770MHz帯での30MHz程度の帯域確保)による携帯電話網と連携した無線ICT技術の普及。(電波使用特区)







#### Basic Concept for Ideal Environmental City

Creating sharing communities and self-reliant resilient settlements, circulatory and open-ended, appropriate for the low-carbon shrinking-population era, where local characteristics are charished.



- () Accept varies, it could be harm a constrained could be larger than the next of continuous growth and down conversional growth and down conversional growth for the foreign of the constraint of the foreign of the
- 2) Aim for and emericated buildings that are self-reflect and controlled the strend special and switched and control to surgestings while having open systems controlled to the control-sch.
- 30 Assent for ordall ediploy with low COs on isotonal fault study, importance to local charactery along and history.
- c) Think acts in local energy supple and cuts last as heplinning, will systems based in the vicinity out nas sater and photosation, it should be in compare to protection to at
- e) Solian a facorate system that he serve a berne of near facles and non-zone netricitizes obtained in an deallat and terring here on the factor of the one of the spectrum of a rate of other berning southle.
- (c) Swhoh from individual or no sharing scalary, from Leing alone to e variety of house rolds, modeg multi-generations multiple sectors and presented as a strangement to a.
- 1) Som off a service to a first constant prevention of several states four planning are management level, both "soff and "registion and solar first first are states of several planring several wave mailered in the same of duration."