2012/4/18



Open source method of SIM-Drive to spread the technology of electric cars to all over the world

> Hiroshi Shimizu President and CEO SIM-Drive Corporation

COPYRIGHT© 2009-2012 BY SIM-Drive Corporation ALL RIGHTS RESERVED.

#### Introduction

- SIM-Drive is a company for spreading the fine technology of electric cars to all over the world.
- To realize it, we took "open source" way.
- Our open source way is working well from the view points of the purpose of spreading the technology.

Introduce SIM-Drive's unique open source method.

#### Open source method of SIM-Drive

- Hiroshi Shimizu have been working to develop fine electric cars for more than 30 years and engaged in the development of 14 new concept e-cars until now.
- Everybody can come to SIM-Drive to access the latest technology and information of e-cars.
- Everybody can take technology and information for their own use.

# SIM-Drive open source method require very small expense.

### Why SIM-Drive took the open source way?

- We must spread electric cars to all over the world as soon as possible from the view points of global warming and energy crisis.
- By the open source way, the technology of electric cars could be spread very rapidly because many participants join the project at the time.
- Many companies willing to have technology and information of electric cars, but there are no where to teach them.

#### The effective method to spread electric cars

# Why open source method of SIM-Drive is not free?

- Participants to access SIM-Drive wants to understand the technology, learn the process of development and consider the way to make their own business in e-car field.
- To show all the process, cost of SIM-Drive member is required.
- The best way is that the cost should be shared by all the participants.

SIM-Drive should be independent from other money source for disclose technology

#### **SIM-Drive: Conceptual Diagram**

Frame with built-in components Battery, inverter and controller mounted under car floor

- Light
- More useable space
- Low center of gravity
- Collision safety

#### In-wheel motors

Motors are mounted in all wheels

- Efficient
- Light
- More useable space

#### Efficiency of electric, fuel cell and ice cars



COPYRIGHT© 2009-2012 BY SIM-Drive Corporation ALL RIGHTS RESERVED.

#### The value of automobile



#### Eliica vs Porcshe



#### **Overall SIM-Drive business road map**



#### Advanced prototype development



Participant fee

Member of participants

Share of accomplishment

- Documents of design and evaluation
- Technologies and Participants real experiences of development

Car maker

Motor maker

Parts maker

Material maker

Newcomer

Dealer

Distributor

Local government

We will develop prototype based on accumulated technology and share the results.

#### **Unveil of SIM-WIL**



## Highlight of SIM-WIL

- Drive range achieved over 351km @ JC-08 mode
  - Acceptable by major people
- Provides wide cabin of the E segment with the dimensions of B segment
  - Wide space in prestige class with
    1300-1500cc class exterior dimensions
- Accelerate from 0 to 100km/h in 5.4 seconds
  The performance of middle class sports

High grade ride comfort was confirmed through running tests on the proving ground driven by professional driver

#### Organizations Permitting Public Announcement of Participation in Project 1

Benesse Holdings, Inc. Dynax Corporation **ENELOP** Inc. **IHI** Corporation Inoue Manufacturing Co., Ltd. Iriso Electronics Co., Ltd Isuzu Motors Limited Japan Aviation Electronics Industry, Ltd. Kureha Corporation Mitsubishi Corporation Mitsubishi Motors Corporation Mitsui & Co., Ltd. Mitsuiwa Corporation Nano-Optonics Energy, Inc.

Nikkan Industries Co., Ltd. Nippon Telegraph and Telephone East Corp. **Olympus** Corporation Okayama Prefectural Government **Pioneer Corporation** Sanden Corporation Serio Corporation Tanaka Kikinzoku Group TECO Electric & Machinery Co., Ltd. Teikoku Piston Ring Co., Ltd. THK Co., Ltd. Tokyo Electric Power Company Totoku Toryo Co., Ltd. Tottori Prefectural Government

(Alphabetical order)

34 participating organizations in total, including those not permitting public announcement of their participation

#### Organizations Permitting Public Announcement of Participation in Project 2

Advantest Corporation Asahi Kasei Corporation Bosch CAR MATE MFG. CO., LTD. Chiyoda Corporation Dassault Systems K.K. Du Pont Kabushiki Kaisha Du Pont-Mitsui Polychemicals Co., Ltd. Hitachi Advanced Digital, Inc. Hitachi Chemical Company, Ltd. Kawasaki Industrial Co., Ltd. Kuraray Co., Ltd. Mikuni Corporation Mitsuuroko Co., Ltd

Nihon Parkerizing Co., Ltd. **Oiles Corporation** Polyplastics Co., Ltd. PSA Peugeot Citroën Somic Ishikawa Inc. Sunstar Engineering Inc. Takata Corporation TBK Co., Ltd. Tohoku Electric Power Co., Inc. Tokyo MK Corporation TOPPAN PRINTING CO., LTD. Toray Industries, Inc. Toyota Tsusho Corporation T.RAD Co., Ltd.

( Alphabetical order ) 34 participating organizations in total, including those not permitting public announcement of their participation

#### Organizations Permitting Public Announcement of Participation in Project 3

ARGO GRAPHICS Inc. Daikin Industries Ltd. **DENSO CORPORATION** D.I.D Co., Ltd. DSM Japan Engineering Plastics Fujikura Ltd. **GMB** Corporation HASHIMOTO SOGYO Ltd. Hirata Corporation JUST AUTOMOBILE LEASING CO.,LTD. Lithium Energy Japan Mitsubishi Electric Corporation Mitsui Fudosan Co., Ltd.

Nakagawa Special Steel Co., Ltd. NGK SPARK PLUG Co., LTD. NHK SPRING CO., LTD. NTN Corporation RENIAS CO., LTD. SANGO Co., Ltd. Sekisui House Ltd. Stanley Electric Co., Ltd. Sumitomo Heavy Industries Ltd. TOKYO ELECTRON DEVICE LIMITED Ube Industries Ltd. The Yokohama Rubber CO., LTD.

(Alphabetical order)

26 participating organizations in total, including those not permitting public announcement of their participation **SIM-Drive** 

#### Merits to join the project

- Get the fine technology of electric car.
- Get the information of electric car accumulated in SIM-Drive.
- Make a good network between participants of the project.

By reasonable expense, biggest merits will be gotten

#### Conclusion

 Open source method of SIM-Drive was successful on the project No.1 and No.2.

And No.3 was started well.

- With 3 years, around 100 participants learn the technology deeply and made a good relationship between each participants.
- The technology of SIM-Drive will be spread very rapidly by way of each participants.

Open source method of SIM-Drive will be a good example to spread a distractive technology to all over the world