

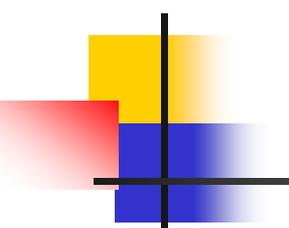
Introduction of China electric vehicle standardization work



National Technical Committee of Auto Standardization
Automotive Standardization Research Institute, China Automotive
Technology and Research Center

Zhou Rong

July 11, 2011



Outline

1. Status of China's electric vehicle standards

2. Comparison and interface with international standards

3. Work plan for the future

1. Standardization committees of electric vehicle



Electric vehicle

TC114

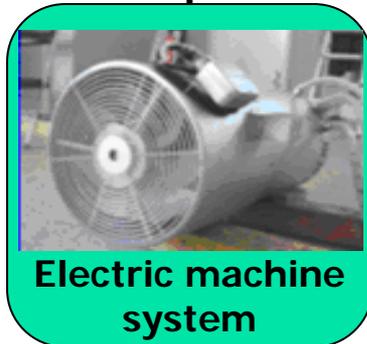
TC247

- TC114 National technical committee of auto standardization
- CEC China electricity council
- TC26 Rotary machine
- TC67 Electrical accessories
- TC69 Lead-acid battery
- TC77 Alkaline battery
- TC243 Nonferrous metals
- TC247 Auto repair
- TC309 Hydrogen
- TC342 Fuel cell
- TC457 Battery materials



Traction battery system

- TC114 TC67
- TC77 TC242
- TC343 TC309
- TC342 TC457



Electric machine system

- TC114
- TC26



Control system

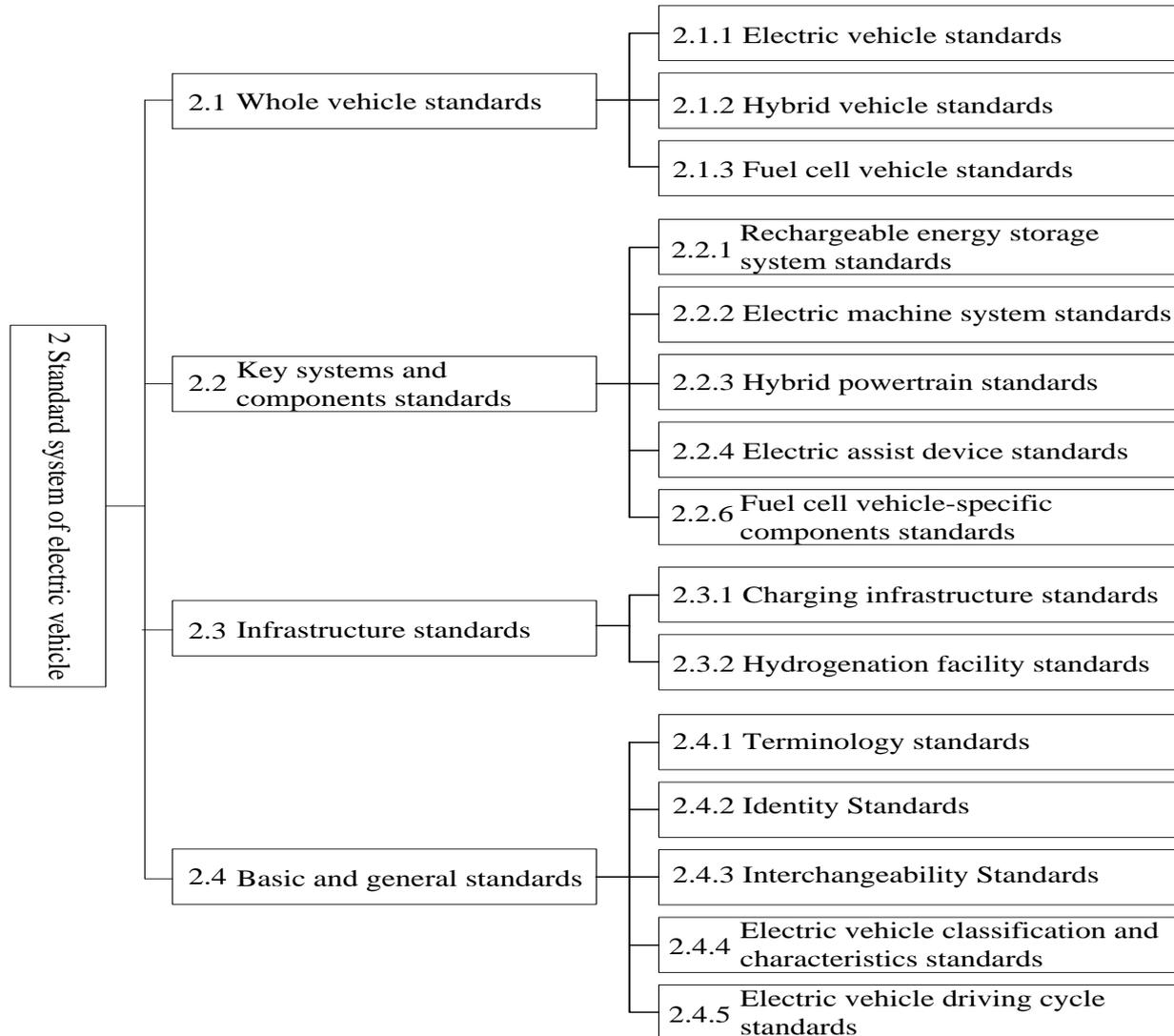
- TC114
- TC26

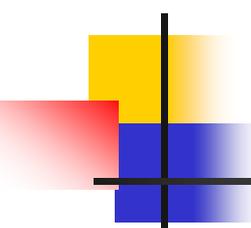


Infrastructure

- TC114 CEC
- TC67 TC309
- TC342

2. Standard system of China electric vehicle

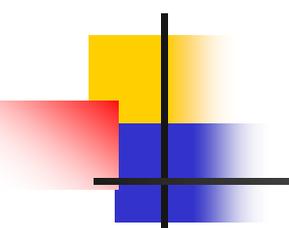




3. Released standards of electric vehicle in China

Since “Ninth Five Years Plan”, national technical committee of auto standardization (NTCAS) have organized and drafted 46 electric vehicle standards (33 national standards and 13 automotive industry standards) which have been approved and released by standardization authorities.

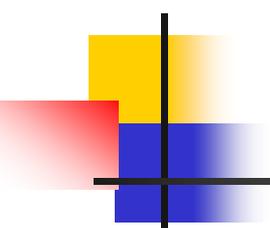
There are 4 standards which are equivalent to international standards; 16 standards were developed by referring the international standards; 26 standards were self-developed.



4. Under developing electric vehicle standards

- 15 standards are waiting approval (Including 2 revision standards);
- 17 standards are planning to develop and revise (Including 4 revision standards);
- 35 standards under preliminary study even without standards development plan;
- After research and discussion, 200 standards will be developed and revised to meet the electric vehicle research, industrialization, demonstration operation and government management in the next four years.

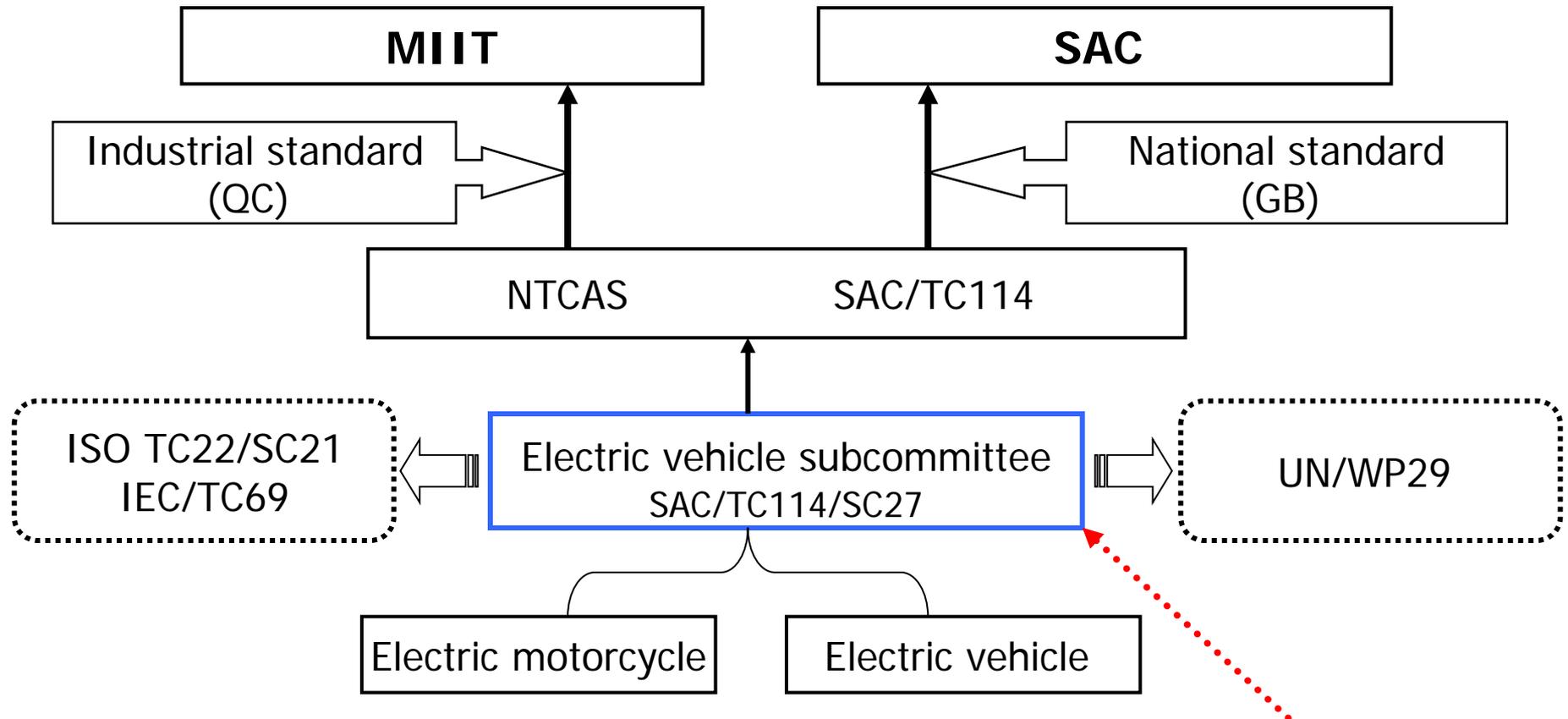
This electric vehicle standard system is the world's most extensive coverage, the largest number of electric vehicle standards.



5. Application of electric vehicle standards

- Since the first standards of electric vehicle had been released at 2001, it become the basis and technical support for the project application and evaluation, such as state 863 program, and it also technically support the electric vehicle technology innovation, demonstration operation, such as Shanghai Expo;
- The released “Renewable energy automotive manufacture and product access management” by Ministry of Industry and Information Technology (MIIT) at June, 2009 describe that electric vehicle must meet existing conventional test items and specific standards;
- 26 electric vehicle testing standards including national and industry standards were drafted by electric vehicle technical subcommittee of NTCAS, more than 350 varieties of electric vehicle on the announcement;
- Electric vehicle standards take an import role in electric vehicle industry, manufacture and product access, allowance of private purchase, etc.

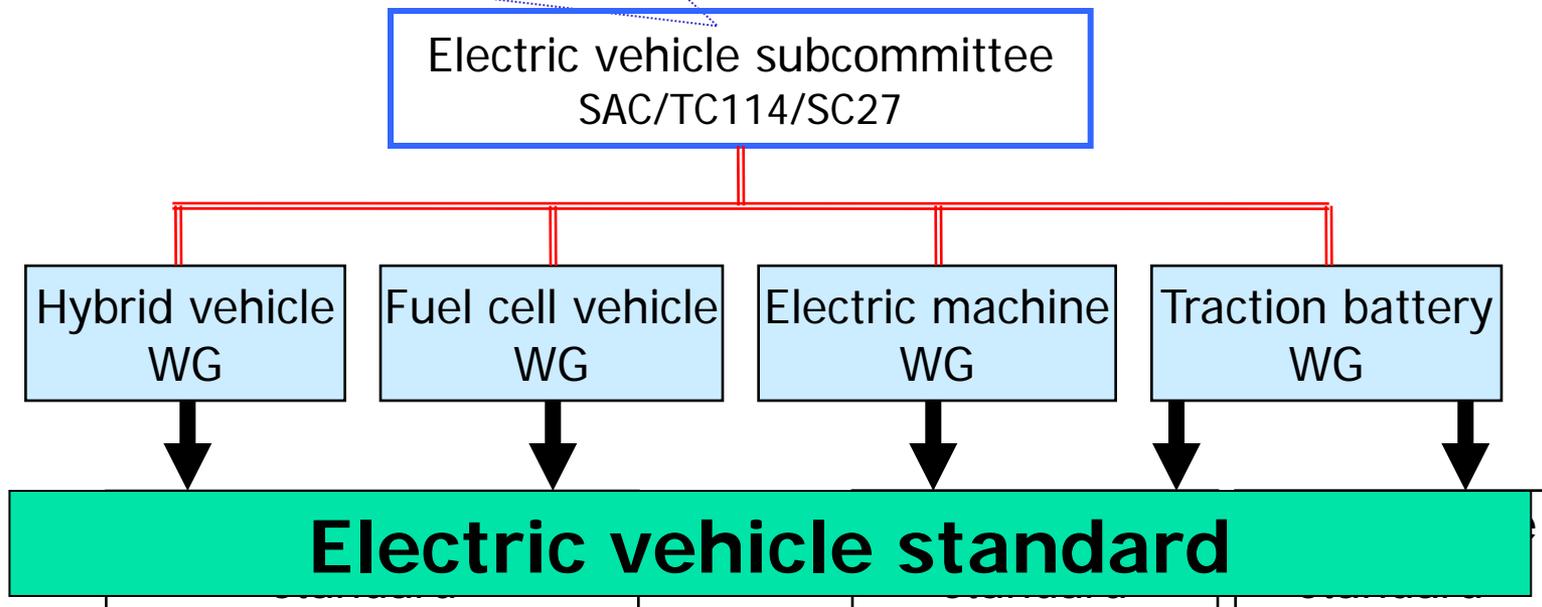
6. Introduction of electric vehicle subcommittee

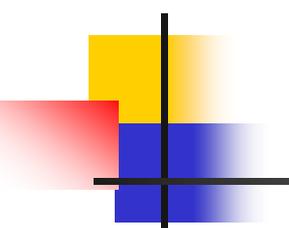


- ★Founded by NTCAS at 1998, secretariat is located at CATARC;
- ★Guided by SAC and MIIT; ★Interface with ISO/TC22/SC21 and IEC/TC69;
- ★Responsible for national electric vehicle standardization

6. Introduction of electric vehicle subcommittee

37 committee members and 6 observers from electric vehicle manufacture, traction battery company, electric machine company, electric motorcycle company, inspection institute, university and research institute, etc.





Outline

1. Status of China's electric vehicle standards

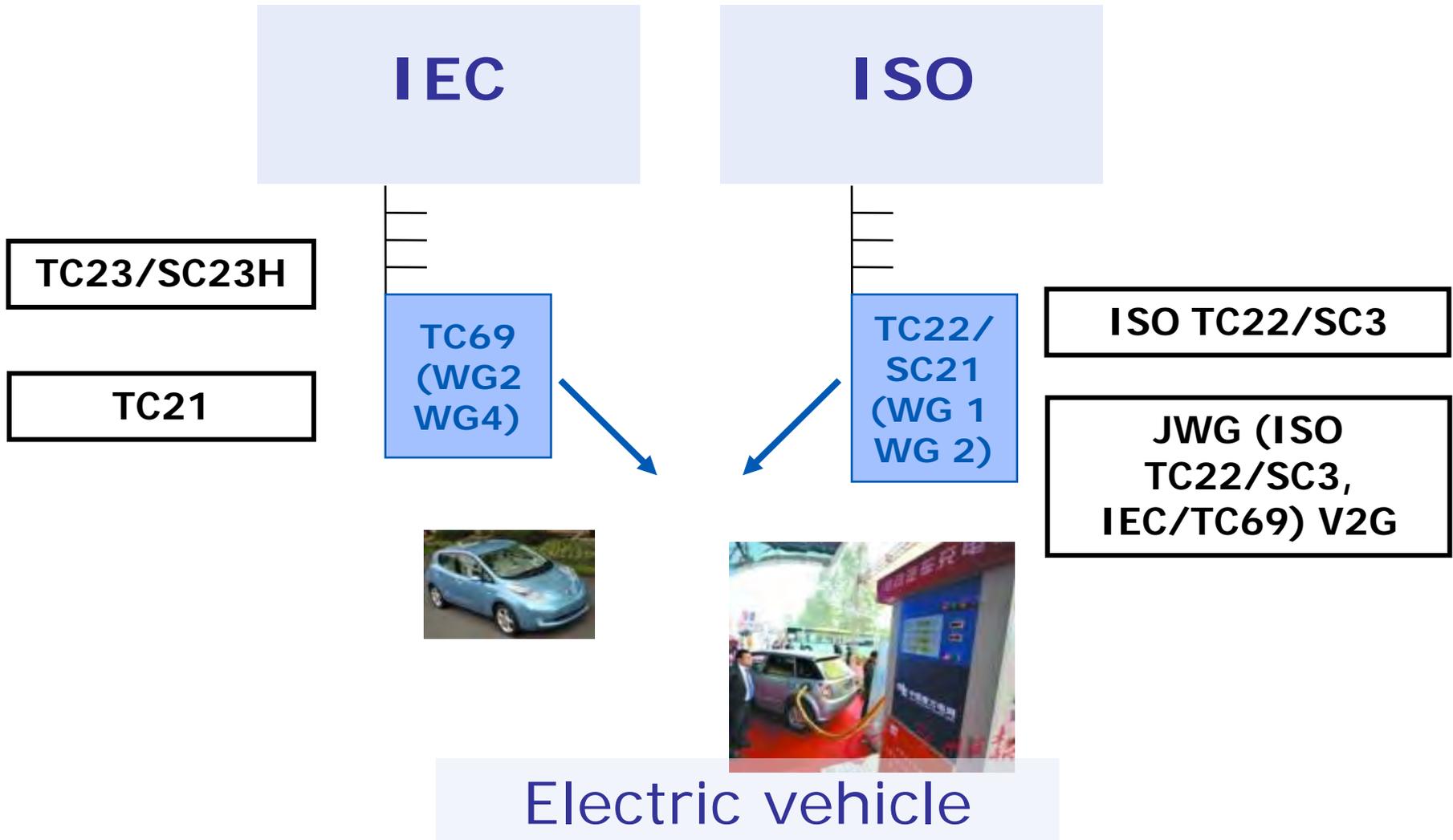
2. Comparison and interface with international standards

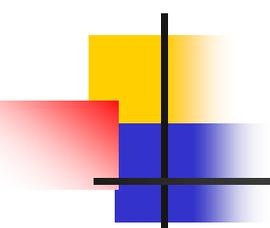
3. Work plan for the future

1. Comparison with international standard

Type		China (46)	ISO (13)	IEC (9)	SAE (40)
Whole vehicle	Electric vehicle	12	5	0	7
	Hybrid vehicle	7	2	0	
	Fuel cell vehicle	4	5	0	2
	Electric motorcycle	6	0	0	0
General standard		3	1	0	2
Key components standard	Traction battery	7	0	5	19
	Electric machine and controller	3	0	0	1
	Infrastructure	4	0	4	18

2. Status of international standards





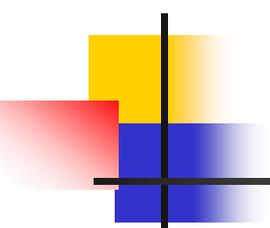
2. Status of international standards

ISO/
TC22/
SC21

13 standards released
4 standards under development

IEC/
TC69

9 standards released
11 standards under development
6 standards plan to revise



2. Status of international standards

SAE

40: released
34: under
developing
and revising

Hybrid vehicle standard committee

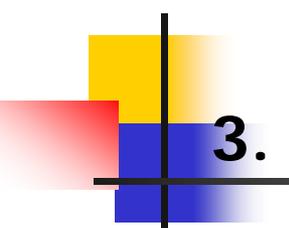
Battery standard committee

Fuel cell vehicle standard committee

light duty vehicle performance and
economy measurement committee

Hybrid truck and electric vehicle committee

Pedestrian traffic noise committee

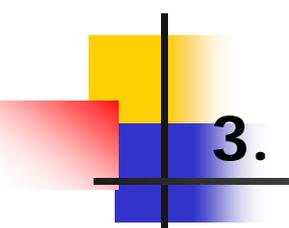


3. Standards with international influence-example

GB/T Connection set of conductive charging for electric vehicle
Part 1 General requirements—corresponding to IEC 62196-1
Part 2 AC charge coupler—corresponding to IEC 62196-2
Part 3 DC charge coupler—corresponding to IEC 62196-3

Note:

- The charge coupler standard system of GB and IEC is same;
- It is nearly the same time for GB and IEC to carry out the research work of charge coupler, however, GB is more faster than IEC. 3 standards of charge coupler already have been reported to authority for approval in China.



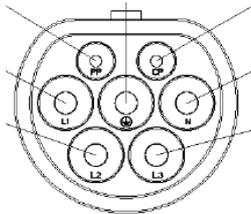
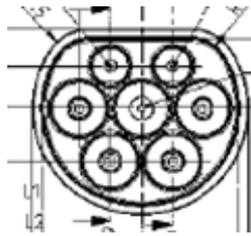
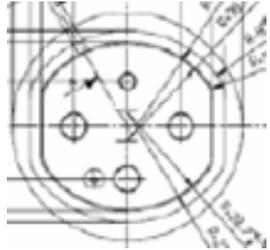
3. Standards with international influence-example

Part 1 The general requirements of GB/T and IEC is basically same.

- The requirements of charge coupler at structure, safety, environment and ingress protection are described in detailed;
- GB/T filled the emptiness for DC charge coupler at breaking capacity test;
- It is more clear for the requirements of GB/T at operation life and force, etc. The test method is more feasible.

3. Standards with international influence-example

Part 2 AC charge coupler

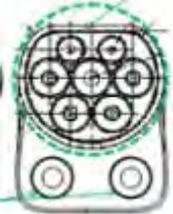
	China standard	IEC 62196-2					
		Type1 (Japan, US)	Type2 (Germany)		Type3 (Italy)		
			Single (can be extended to three)	Single	Three	Single-control guide	Double-control guide
IEC.		Single	Single	Three	Single	Single	two
Circuit	16/32A	32A/80A	70A	63A	16A	32A	32A
Voltage	220V	≤250V	≤ 480V		250V	250V	500V
PIN and lock	7 Mechanical + electronic lock	5 Mechanical lock	7 Electronic lock		4		5
					Electronic lock		
Interface type							

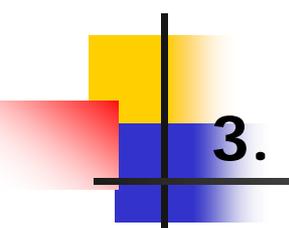
The characteristics of China AC charge coupler:

- Similar with type 2 of IEC, but with double lock protection;
- The standard progress and practical application are faster than

3. Standards with international influence-example

Part 3 DC charge coupler

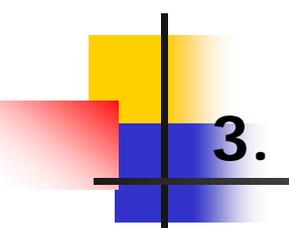
	International standard			
Parameter	China proposal	US proposal	Japan proposal	EU proposal
Structure	<p>The characteristics of China DC charge coupler:</p> <ul style="list-style-type: none"> ● Already submitted to IEC and under consideration; ● The rang of rated value is more reasonable; ● DC special; ● CAN is popular in vehicle 			
Rated voltage	750V/250A	600V/200A	600V/150A	850V/200A
Communication	CAN	PLC	CAN	PLC
Status	National standard for approval	Conceptual design	ChadeMo association Standard	Conceptual design



3. Standards with international influence-example

GB/T 24549-2009 Fuel cell vehicle safety requirements

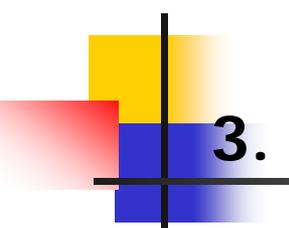
- Safety of gaseous hydrogen, electricity, hydrogen, pressure vessel;
- Developed by China's own technical innovation and experience;
- Benefit for China to develop fuel cell vehicle global technical regulation with UN;
- Provide support for fuel cell vehicle research and demonstration operation in China.



3. Standards with international influence-example

QC/T816-2009 hydrogen fueled vehicle technical specification

- It is very important that hydrogen fueled vehicle ensure fuel cell vehicle operating conveniently before the infrastructure is ready;
- The first standard related hydrogen fueled vehicle in the world;
- Support from Tongji university.

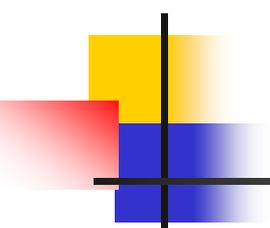


3. Standards with international influence-example

GB/T Hydrogen fuel cell vehicle demonstration operation specification

GB/T Fuel cell vehicle demonstration operation facilities specification

- Safety, operation and management of vehicle and infrastructure
- This two standards are developed by China and could be a sample for other countries;
- Developed for Beijing Olympic games and Shanghai Expo



4. Interface with international standard

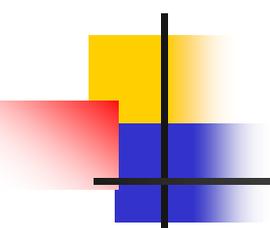
- Interface with WP29

- The revised version of ECE R100 “Technical requirement, test method and relevant provision for Electric vehicle” was approved by vote. The scope of this standard was extended from electric vehicle to other kinds of electric vehicle model.

some requirements of this standard is applied in GB/T 18388 and GB/T 19750.

- ECE R83, ECE R101, CAFÉ

Some clauses are adopted by consumption and emission related standards, such as GB/T 18386, GB/T19753, GB/T19754, GB/T19755.



4. Interface with international standard

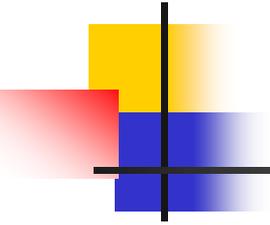
- Interface with IEC and ISO

- some clauses of IEC61254-1~4 and IEC61892-1~3 are quoted by battery related standards, such as QC/T 741 ~QC/T 744.

- Some clauses of IEC62196-1 ~2 are cited by GB/T –xxxxx (electric vehicle charge coupler) which are under development, such as general requirements, AC charge coupler.

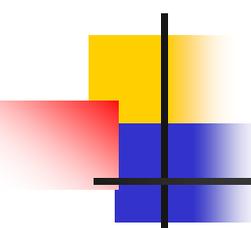
- ISO 6469-1 ~ 3 are quoted by GB/T 18384.1 ~ 3 “Electric vehicle safety requirements”

Overall, China’s electric vehicle safety, consumption, emission, battery, charger and charger coupler related standards more or less referred to the standards of WP29, IEC and ISO.



Outline

- 1. Status of China's electric vehicle standards**
- 2. Comparison and interface with international standards**
- 3. Work plan for the future**

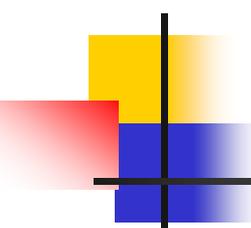


1. Strategy

1) **Goal** : Establish a scientific, systematic, open, orderly and adjustable renewable energy vehicle standard system; Fully meet the research, industrialization, commercialization and management and to become an important technical support for electric vehicle industry; Transform the large number of the latest achievements and advanced experience into the standards and show it to the world, get advantages at international standard activities.

2) **Measurements**:

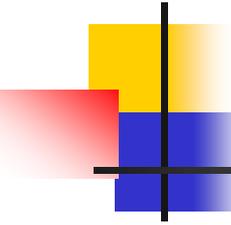
- The strategy of standards development will be transformed from follower to leader;
- The technical route of standards development will be transformed from research to the joint of research and industrialization;
- The work emphasis of standards development will be on the coordination of enterprise, industry and national standard.



2. Work plan of standardization during twelfth five years plan

- First phase: Set up standard system scheme and develop urgent needed standards (Sep, 2010-Dec, 2011)

Key tasks: Set up standards system scheme by concentrating all the forces and develop some urgent needed standards (32 important standards) in order to cooperate with research project, industrialization, demonstration operation, subsidies of energy saving and private purchase.

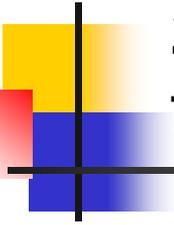


2. Work plan of standardization during twelfth five years plan

- Second phase: implement the standard developing plan (Jan, 2012-Dec, 2013)

Key tasks: fully implement the standard developing plan and develop standards rapidly (26 important standards), basically change the asynchronous situation between standards and industrialization.

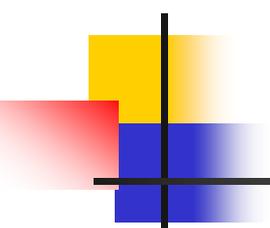
- Develop standards for some technical areas where without related standards;
- Coordinate the number of standard and requirement;
- Coordinate the standard with research, industrialization, demonstration operation.



2. Work plan of standardization during twelfth five years plan

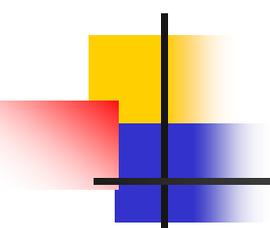
- Third phase: Optimize standards (Jan, 2014-Dec, 2015)

Key tasks: Optimize the standards plan for renewable energy vehicle and complete the planned standards (20~30 standards); to meet the requirements of research, industrialization, commercialization and management.



3. Work plan of electric vehicle committee this year

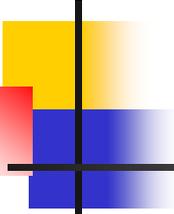
- Complete 11 standards: 3 standards have been submitted for review at June; 8 standards will be reviewed end of this year;
- Organize technical experts from China and Germany to discuss the passive safety of electric vehicle at the Frankfurt motor show and visit VW company (based on the cooperation framework between SAC and German ministry of economic);
- Oct 10~12, international symposium of electric vehicle standard at Xi'an;
- The standards review meeting will be hold end this year.



4. Cooperation and coordination with international standards this year

1) WP29

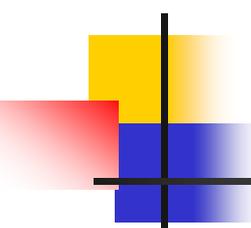
- a) Actively involved in the activities of WP29/GRSP/ELSA and submit the proposal of electric vehicle crash;
- b) Actively involved in the activities of fuel cell vehicle GTR drafting group;
- c) Achieve active results at safety requirements of UN HFCV-GTR and complete the first phase draft.



4. Cooperation and coordination with international standards this year

2) ISO

- set up work group and develop the standards of “Electric motorcycle terminology ” and “Safety requirements of lithium-ion battery pack for electric motorcycle”;
- Start the procedure of ISO standard application for “Safety requirements of frontal crash for electric vehicle” which is developed by China;
- Involve in ISO standard development of “Lithium-ion battery size and safety requirements for electric vehicle” and put forward China’s proposal.



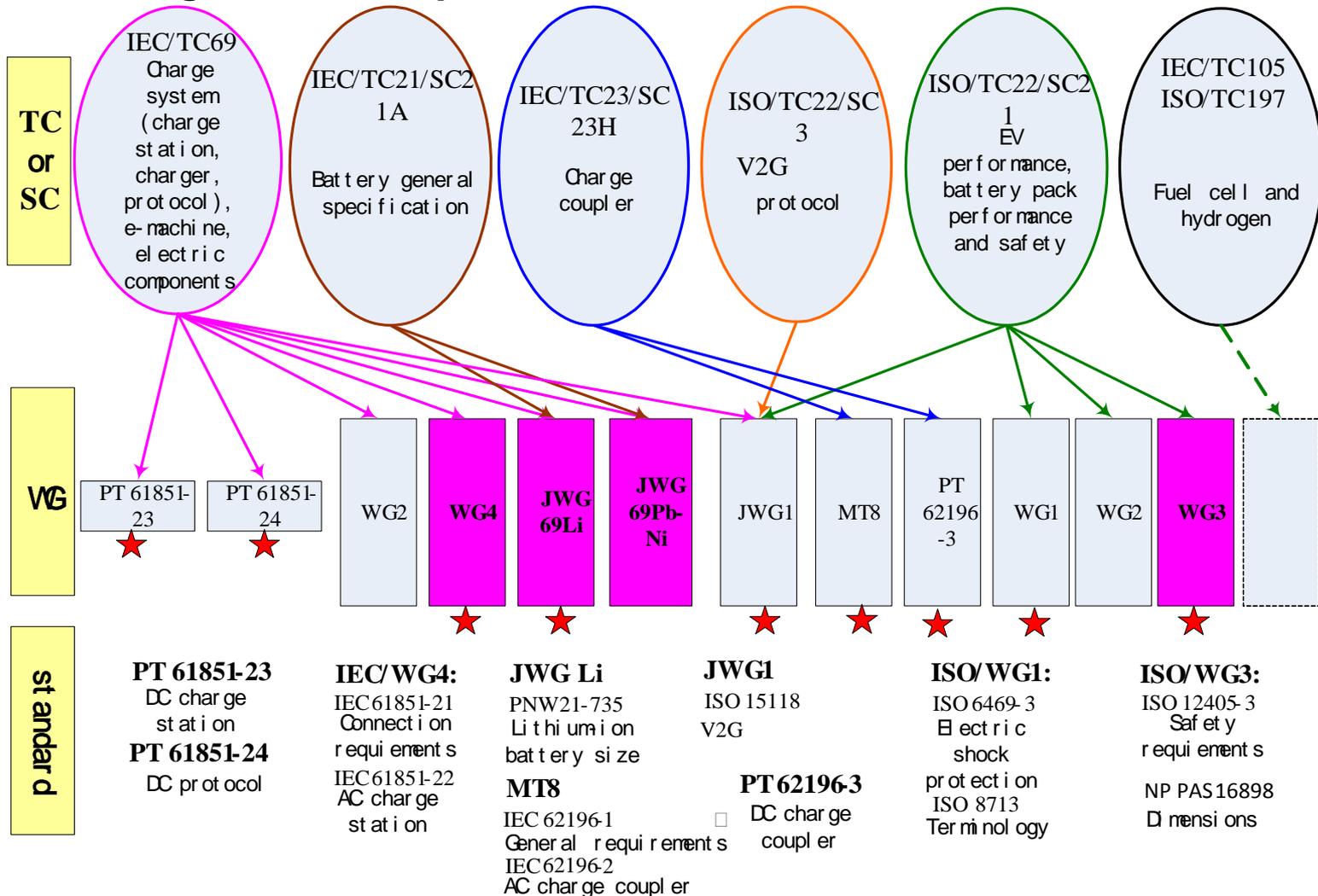
4. Cooperation and coordination with international standards this year

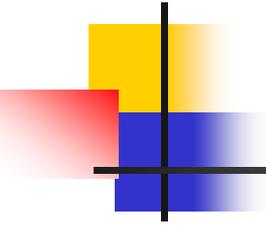
3) IEC

- Actively participate IEC62196-3 standard development and try to make China's DC charge coupler standard become the part of IEC62196-3;
- Actively participate IEC "Traction battery size" standard development and put forward China's proposal.

4. Cooperation and coordination with international standards this year

4) Recommend experts for IEC/ISO and strengthen the working relationship





Thank you for listening!

