National Development and Reform Commission of the People's Republic of China

Ministry of Science and Technology of the People's Republic of China

Ministry of Water Resources of the People's Republic of China

Ministry of Construction of the People's Republic of China

Ministry of Agriculture of the People's Republic of China

Announcement

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The National Development and Reform Commission,Ministry of Science and Technology,Ministry of Water Resources,Ministry of Construction and Ministry of Agriculture have jointly worked out the China Water Conservation Technology Policy Outline to provide guidance to the development and application of water conservation technology,push forward the progress of water conservation technology,enhance the efficiency of water use and its benefits,and promote the sustainable utilization of water resources.It is now released and implemented as of the date of issue.

Appendix: China Water Conservation Technology Policy Outline

National Development and Reform Commission
Ministry of Science and Technology
Ministry of Water Conservancy

Ministry of Construction
Ministry of Agriculture

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Appendix:

China Water Conservation Technology Policy Outline

The China Water Conservation Technology Policy Outline (hereafter Outline) is worked out to provide guidance to the development and application of water conservation technology,push forward the progress of water conservation technology,enhance the efficiency of water use and its benefits,and promote the sustainable utilization of water resources.The Outline mainly focuses on the popularization of water conservation technology,techniques and equipment before 2010,and gives relative considerations to medium and long-term water conservation technology.

1. General situation

1. 1China is a country scarce in water resources.Its per capita water resource is about 2,200 m3,accounting for one fourth of the world average level.Because various regions are situated in different hydrologic belts and affected by the monsoon climate,China has an extreme imbalance in the distribution of precipitation over time and space.The distribution of water,land and mineral resources is not adapted to the structure of industrial and agricultural water consumption.With serious water pollution,the lack of quality water has exacerbated water supply shortages.

1.2 The tension between the supply of and demand for water resources is obvious.In normal years,the national water deficit is about 40 billion m3.The water crisis has seriously impeded socioeconomic development in China.Due to water scarcity,tension has grown from struggles over water between industries and urban life,agricultural production and the ecological environment.In some parts of the country,rivers have dried up,the underground water level continues to decline and the environment deteriorates day by day.In recent years,urban water scarcity is also severe.The nature of water scarcity is shifting from engineering-oriented water scarcity to resource-oriented and quality-oriented scarcity.Urban water scarcity shows a tendency of evolving from a regional to a national problem.In some cities,water scarcity has seriously affected living conditions.Urban development faces a challenge.

1.3 With economic and social development,the demand for water continues to grow.The consumption structure is continuously adjusting.In 2003,the proportion of agricultural water consumption (including forestry and wetland) of the total dropped to 66 percent from 88 percent in 1980,while the proportion of industrial water consumption and urban domestic water consumption increased to 22.1 percent and 11.9 percent from 10 percent and 2 percent respectively.Because of differences in China's local socioeconomic development and water resource conditions,the difference in the structure of water consumption is distinctive.With increasing urban,rural and industrial water consumption,the water-consumption structure will undergo further adjustments.Therefore,requirements for quality water and guaranteed supply rate are getting high.

1.4 Water conservation and high efficiency in using water is the fundamental path to release the tension between the supply and demand of water resources.The core of water conservation is to enhance the efficiency of and benefits drawn from water consumption.Currently,China's water consumption for every 10,000 yuan of industrial value-added is 5 to 10 times that of developed countries.The utilization rate of irrigation water in China is only between 40 and 45 percent,leaving a relatively large gap when compared with the advanced levels in the world.There is a great potential for water conservation.

1.5 The government advocates water conservation.It insists on a scientific outlook by placing water conservation in a prominent position.The government encourages the research,development and application of new technologies,new techniques and key facilities for water conservation.It impels measures for water conservation,develops water conserving industry,agriculture and services and constructs water conserving cities and societies.

1.6 Adopt practical comprehensive legal,economic,technological and engineering measures to push forward overall water conservation.Water conservation work should realize "three combinations",namely,the combination of engineering measures with non-engineering measures,the combination of advanced technologies with conventional technologies and the combination of mandatory water conservation with efficiency guidance.

1.7 This Outline stresses the selection principles,implementation paths,development trends,promotion means and encouraging policies for water conservation technology.It is used to guide the research and industrial development of water conservation technology,key technological investment trends for water conservation projects,promote the wide application of water conservation technology,restrict and eliminate outdated and high water-consuming technologies,techniques and equipment and provide technological support to water resource planning and water conservation development.

1.8 This Outline follows the "practical" principle.Measures such as "research","development","promotion","restriction","elimination" and "prohibition" will be taken to guide the development of water conservation technology based on the actual situation in China,and in accordance with the maturity of water conservation technologies,applicable natural conditions,the socioeconomic level of development,and the costs and potential of water conservation.It stresses the research and development and popularization of those advanced and applicable water conservation technologies that are highly efficient,beneficial and have widespread influence.

1.9 The water conservation technologies referred to in the Outline are technologies that can help enhance water utilization efficiency and benefits,reduce water loss and replace conventional water resources.They include direct water conservation technology and indirect water conservation technology.Some of them are energy-saving technology,clean production technology and environmental protection technology.

1.10 This Outline provides technological policy support in order to realize water conservation goals.With the guidance of the Outline,China will strive to achieve "micro-growth" in industrial water consumption,"zero-growth" in agricultural water consumption and a gradual reduction in overall per capita water consumption in urban cities between 2005 and 2010.

2. Agricultural water conservation

Ninety percent of agricultural water consumption is used for irrigation and the rest is used for forestry,animal

husbandry,fishery and drinking water for rural people and domestic animals.Although the proportion of rural water consumption was decreased significantly in recent years,agriculture is still the No.1 consumer of water in China.Developing highly efficient water conserving agriculture is a fundamental strategy of the country.

2.1 Optimizing water dispatch technology for agriculture

Water resources for agricultural consumption consists of precipitation,surface water,underground water,soil water and return water,briny water and regenerated water that has been treated to bring it up to the water quality standard.By means of engineering measures and non-engineering measures,optimizing various water resources is the basic requirement for realizing planned water consumption,water conservation and enhancing the efficiency of agricultural water consumption.

2.1.1 Actively develop technology to unify dispatching of water from multiple resources.Greatly popularize various agricultural water-consuming projects control and dispatching methods,use surface water with high efficiency,reasonably exploit underground water,reasonably dispatch and use water resources across time and space,develop "long-vine melon" irrigation systems and irrigation water management technology,realize the unified dispatching of water and enhance dispatching-storage and anti-dispatching abilities within the irrigation area.

2.1.2 Gradually push forward the controls over the total amount and quota management of agricultural water consumption.Speed up setting the total amount indicators for agricultural water consumption for different regions in different precipitation years,setting irrigation water consumption quotas for different plants under different irrigation methods and conditions.Reasonably adjust the water consumption proportion for farming,forestry,animal husbandry,sideline production and fishery.

2.1.3 Set up water-saving high efficiency crop systems that adapt to water resource conditions.Advocate the development and application of hygrophilous plant planting technology.Based on the conditions of local water,soil,sunshine and heat resources,and based on the high efficiency and water conservation principle,crops should be decided by water conditions.Reasonably arrange the crop planting structure and irrigation scales.Restrict and reduce the plant area of high water-consuming and low output crops.

2.1.4 Develop the combined irrigation technology of wells and ditches.Popularize and apply unified adjustment and control technology for surface water and underground water.Advocate dual-irrigation from wells and ditches.Use well water,supplemented by ditch water,to irrigate.Pay attention to research on technologies regarding the balance between underground water exploitation and replenishment.

2.1.5 Develop soil moisture and drought supervision and forecasting technology.Strengthen research on the changing rules of large-scale soil moisture and research on soil moisture and drought index systems across time and space.Actively research and develop soil moisture,drought supervision instruments and facilities.

2.2 Highly efficient water transfer and dispatching technology

Agriculture-use water loss during the process of transfer and dispatching occupies a great proportion of water used.It is the main focus of agricultural water conservation to enhance the efficiency of water transfer.

2.2.1 Suit applications of ditch anti-leakage technology to local conditions.Give priority in taking anti-leakage measures to ditches and branch ditches that cause great loss and low-efficiency in water transfer.Advocate overall anti-leakage to fix ditches that are not required to supplement the irrigation water from wells.Popularize anti-leakage to ditches in the pumping irrigation areas.

2.2.2 Develop pipeline water transfer technology.When renovating relatively small volume ditches,low-pressure

pipeline water transfer and dispatch technology should be given priority.In high-lift pumping irrigation areas and areas suited for self-pressure pipeline water transfer,self-pressure pipeline water transfer systems should be given priority in development.

2.2.3 Popularize the adoption of low-cost anti-seepage materials.Advocate the use of spodosol,cement,stones and other local materials.Popularize common materials for mature ditch anti-seepage projects such as concrete,bituminous concrete and plastic film.Encourage the use of geotechnic film such as compound geotechnic film,modified bituminous water-proof materials and anti-seepage materials of polymer fiber concrete,soil solidifying substance and geotechnic synthetic bentonite cushion on the basis of the experimental research.Strengthen research into the new ditch anti-seepage materials,techniques and construction facilities under different climate and soil quality conditions.Strengthen research into and product development of anti-seepage,anti-freezing and anti-expansion ditch technologies.

2.2.4 Develop anti-seepage ditch cross sectional scale and structure optimization design technology.Large and medium-sized anti-seepage ditches should adopt non-standard cross sections with sloped or arced bottoms.Small ditches should use the U-shaped cross section.Medium and small-scale ditches should use concrete anti-seepage stone laying.Advocate the use of standardized design technology and the on-the-spot assembly of factory prefabricated materials.

2.2.5 Actively develop ditch system dynamic water dispatching technology.Develop and apply real-time irrigation forecasting technology.Strengthen the research and application of irrigation area water use management technology.Advocate dynamic planned water use management.

2.2.6 Speed up water measuring and survey technology in irrigation areas.Encourage the research,development and popularization of small water measuring facilities that are highly accurate,low in cost,strong in application,easy of operation,and convenient for managing and maintaining.

2.2.7 Develop ageing prevention technology for water transfer projects.Actively research technologies of ageing prevention for water transfer constructions,disease diagnosis and corrosion prevention,restoration and leakage-blocking technologies.Speed up the development of consolidating technology and the product development of water-transfer constructions.

2.3 Field irrigation technology

Field irrigation is the last sector for enhancing the utilization rate of irrigation water.It is also the basis for water diversion,transfer and dispatch.It is the key part of agricultural water conservation for improving field irrigation technology.

2.3.1 Improve field irrigation technology.Popularize narrow border irrigation,tiny-stream furrow irrigation and wave irrigation.Reasonably set furrow and strip specifications and field natural slope and shrunk field.Popularize high-accuracy field leveling techniques,encourage the use of laser field leveling.Scientifically control the irrigation factors affecting water volume into the strips (furrows),water intake and irrigation quotas,and the proportion of water volume changes.Eliminate no-border wild-flooding irrigation.

2.3.2 Greatly popularize water management technology that is based on rice-field dry-wet alternate irrigation.Advocate square fields in rice irrigation areas and adopt rice shallow-wet control irrigation techniques.Advocate the combined technique of rice soaking and tilling.Develop the technique of rice "three-

drought" tillage,drought breeding and rarefaction plant and seedlings tossing.Eliminate long-term wild-flooding rice irrigation.Prohibit continuous irrigation and draining techniques for rice fields.Actively research suitable rice field water standards,soil water control indexes,rice field drying techniques and related irrigation systems.

2.3.3 Suit the development and applications of sprinkler irrigation technique to local conditions.Actively encourage the application of sprinkler irrigation techniques in commercial crop planting areas,suburban agriculture areas and concentrated scaled management areas.Give priority to the popularization of light and small-type complete sprinkler irrigation techniques and equipment.In hilly areas or areas with self-pressure conditions,encourage the development of self-pressure sprinkler irrigation techniques.Actively research and develop low-cost,low energy-consumption,easy-to-use sprinkler irrigation equipment.

2.3.4 Encourage the development of micro-irrigation techniques.Widely popularize micro-sprinkler irrigation and drip irrigation techniques in fruit tree planting areas and in areas where agriculture requires facility support,offers quick returns and earns foreign exchange.Advocate the combination of micro-irrigation techniques with the agronomic techniques of field film cover,and synchronous supply of water and fertilizer.Encourage the development of self-pressure micro-sprinkler irrigation,drip irrigation,tiny-stream irrigation in hilly areas where the ground has natural slopes.Encourage the use of rainwater cache storage projects to develop and apply low-water gravity micro-irrigation techniques.Actively research and develop low-cost,low energy-consumption and multi-purpose micro-irrigation equipment.

2.3.5 In the areas where the spring drought is serious but late natural precipitation can basically meet the needs of crop growth,widely popularize sitting-water planting techniques.Advocate the research and development of low-cost,good-performance,high-efficiency dual unified water-supplement planting machine tools.

2.3.6 Encourage the application of accurate control irrigation techniques.Advocate timely and proper irrigation.Strengthen research on the physiological features and water demand of crops.Actively research the relations between the crop growth and soil water content,nutrition,air moisture,atmosphere temperature and other environmental factors.

2.3.7 In water-scarce areas,greatly develop various insufficient irrigation techniques.Advocate the technique of "key water irrigation" at the water-demanding critical stage and key growth stage of crops.Encourage experimental research into crop water content production functions.Research crop economic irrigation quotas and optimized irrigation systems.Strengthen research into insufficient irrigation and water-lacking adjustment water conservation production-growth mechanisms.Research and apply controlled root-division alternate irrigation techniques.

2.4 Biological water conservation and agronomic water conservation techniques

Biological measures and agronomic measures can help enhance the utilization rate and production rate of water content so as to save on the volume of irrigation.It is a main water conservation measure for agriculture.

2.4.1 Encourage research into and the application of water/fertilizer coupling techniques.Advocate the reasonable application of a combination of irrigation and manure in terms of times,amounts and methods to adjust the fertilizer with water and apply water and mature together so as to enhance the utilization rate of water and fertilizer.

2.4.2 Advocate water storage and soil moisture preservation techniques such as deep ploughing and loosening,and biological soil nourishment techniques.Improve the soil structure and enhance the water-storage,water-preserving and water-supplying ability of soil.Enhance the utilization rate of natural precipitation and reduce the water volume of

irrigation.Pay attention to the research,development and industrialization of deep-ploughing machine tools.

2.4.3 In the areas where the soil is light,the ground has a big slope or the amount of precipitation is not great,actively popularize protective ploughing techniques.Strengthen research into the three key techniques of straw mulching treatment,mechanical biological tillage and chemical herbicide use in protective ploughing.Strengthen the research and industrialization of protective ploughing machine tools that are applicable to different areas.

2.4.4 Popularize field water-increasing techniques.Develop film and furrow-sowing techniques.Strengthen research into low-cost and completely degradable film.Strengthen research into and the development of techniques of soil surface water-preservation and thermal enhancement.

2.4.5 Develop and apply transpiration and evaporation inhibition techniques.Advocate the application of leaf anti-drought spray during the high water-demanding period of crops.Encourage research into and the industrialization of drought-resistant water conservation products that have functions of metabolism,filming and reflection.

2.4.6 Popularize varieties of drought-resistant,high-yield and quality crops.Speed up the development of molecular biology techniques for the breeding of drought-resistant,water conservation crop species.Select and breed new species of drought-resistant,drought-enduring and high-efficient water-utilizing crops.

2.4.7 Encourage seed dressing with plant-coating and water-preservation agents.Strengthen research into and the development of low-cost,multi-functional water-preserving seed dressing agents and water-preserving products and equipment specialized for economic crops and grasslands.

2.5 Precipitation and return water utilization techniques

Enhancing the utilization rate of precipitation and the repeated utilization rate of return water can directly reduce the water volume of irrigation.It is the most basic content of the agricultural water conservation program.

2.5.1 Popularize the utilization technique of precipitation storage.Actively develop field management techniques for different crops and different precipitation conditions.Popularize irrigation systems and techniques that co-ordinate crop water-consumption with natural precipitation.In drought-resistant crop zones,popularize field leveling techniques and improved ploughing techniques that aim to restore natural precipitation.In rice planting zones,actively popularize rice shallow-irrigation and deep-storage techniques.In drought and semi-drought zones and hilly areas that have poor water conservation capacities,popularize rain-collection water-preservation techniques with rhegmalypts and level furrows.

2.5.2 Popularize techniques of utilizing return water for irrigation.Actively develop irrigation-drainage unified management techniques.In areas that have no saline and alkaline threat,prohibit ineffective water receding and low-effective drainage irrigation water management techniques.In areas where the quality of irrigation return water is not up to the standard of irrigation water,actively develop the simple "mixed watering of salty and fresh water" irrigation return water safe utilization technique.

2.5.3 Greatly develop rain-storage utilization techniques.Popularize facility agriculture and courtyard rain-collection techniques.Popularize engineering facility standardization.Research and apply water quality protection techniques in the use of stored rain.Actively develop environmentally friendly,highly effective,low-cost new materials for rain-collection,preservation and anti-seepage.

2.6 Unconventional water utilization techniques

Based on experimental research,increase agricultural water-resources by safely using such unconventional as part of

the resurgent water,brackish water and desalted seawater or through unconventional means such as artificial rain-increasing techniques.

2.6.1 Develop techniques for unconventional water resources.Develop techniques for the multiple use of water and use waters according to their different qualities.Develop the technique of the mixed use or alternate use of unconventional water and fresh water.Set up sewage water irrigation volume quota systems and salty water irrigation control quota systems.Develop supervision and appraisal techniques for determining ground water and surface water quality,crop output and quality,and the physical and chemical features of soil while using unconventional water.Strengthen research into the drainage and treatment of daily-life sewage and brackish water.Actively research and develop economically effective unconventional water treatment equipment and water quality supervision instruments.

2.6.2 Pay attention to the development of artificial rain-increasing techniques.Artificial rain stimulation should follow the principle of government leadership,coordinated planning and reasonable distribution.In the artificial rain potential area of bedded cold clouds and convective clouds,adopt artificial rain-increasing catalysis techniques.Set up artificial rain-increasing comprehensive decision-making technological systems.

2.6.3 Properly develop techniques of seawater utilization.Encourage the reasonable use of seawater resources in the breeding sector or other agricultural and by-product sectors.Strengthen research into techniques of watering salt-enduring crops with seawater diluted with natural fresh water.

2.7 Breeding sector water conservation techniques

Developing breeding sector water conservation techniques,enhancing water consumption efficiency in the breeding sector for forage grass irrigation,animal and domestic fowl drinking water,washing water at animal and domestic fowl breeding sites,temperature reduction water and aquatic products breeding water are all important aspects of agricultural water conservation.

2.7.1 Speed up the development of drought-resistant (drought-enduring) water conservation quality forage grass species selection and breeding techniques.Select and breed wild forage grasses that adapt to local natural conditions or artificially cultivate quality forage grass varieties.Select and breed deep-root,straight small-sized leaf quality drought-enduring grasses that have relatively strong adaptability and resistance in water-scarce environments.

2.7.2 Develop and popularize cultivation techniques for water conservation,drought-resistant quality grasses that adapt to natural grasslands and artificial grasslands.Set up plantation structures and plantation systems that adapt to sunshine resources,water resources and precipitation resources.Reasonably assort different forage grasses of different species such as the fabaceous and gramineae species.Develop and popularize gramineae-fabaceous,forage grass-fodder dynamic plantation or grassland-planting field alternative techniques.

2.7.3 Greatly popularize artificial grassland water conservation irrigation techniques.Popularize grassland water conservation irrigation systems.Adapt the development of grassland irrigation ditch anti-seepage liner and pipeline water-transfer irrigation techniques to local conditions.Encourage grassland sprinkler irrigation techniques under proper conditions.Improve grassland surface irrigation techniques.Develop grassland irrigation water management techniques.Strengthen research into forage grass water-demanding rules,irrigation systems and means of irrigation,and technical experiments.Eliminate grassland no-border wild-flooding irrigation techniques.

2.7.4 Develop grassland water conservation tillage techniques.Advocate grassland ploughless direct seeding

techniques.Develop labor added seeding and plantation techniques.Pay attention to enhancing the ability of grassland soil water storage and fertilizer preservation.Greatly develop pastoral area irrigation fodder production bases.

2.7.5 Develop intensive water conservation breeding techniques.Advocate domestic fowl centralized water supply and comprehensive utilization.Advocate "new-type" environmentally friendly animal and domestic fowl,water conservation temperature reduction techniques and drinking water equipment.Reasonably set up animal drinking water spots and effectively protect water sources and water-supply spots.For grasslands that face water-scarcity and extreme drinking-water difficulties,water pipelines can be built to supply water.Popularize rain-collection techniques and facilities built with concrete structures and brick-stone structures that have anti-seepage and purification functions.Encourage research into automatic water-supply equipment that is water conserving,multiple-powered,simple structure,convenient in use and has a high guarantee rate of water supply.Promote the research and application of water saving,highly efficient factory-style aquatic product breeding facilities.Gradually eliminate water slab long water-supply techniques.

2.7.6 Popularize breeding wastewater treatment and repeated utilization techniques.Popularize breeding wastewater re-use technique after anaerobic treatment and the recycling utilization technique after deep treatment and disinfection for washing sties.Advocate water supply according to different water quality and multi-level utilization.Change the traditional way of water washing manure and soaking manure to dry-cleaning.Research and develop low energy-consumption,highly efficient breeding wastewater treatment facilities.

2.7.7 Develop animal products,aquatic product processing water conservation techniques.Encourage the research and development of multifunctional,low-cost,water conserving and environmentally friendly processing techniques and technological equipment.

2.8 Village and township water conservation techniques

Develop village and township water conservation techniques focusing on the scattered water consumption of village and township residents,the simple nature of their agricultural product processing,the low water-consumption efficiency in villages and townships,the simple facilities for water supply in villages and townships,and the insufficiency of safe drinking water sources.

2.8.1 Develop and promote village and township centralized water-supply techniques.Actively pursue planned water-consumption and develop drinking water source development and utilization and protection techniques.The exploitation of underground water should seal the unhealthy water layers.Prevent and control bad quality water such as bitter and salty water,sewage and wastewater from getting into water sources.Encourage water source protective forest and grassland construction.Push forward a centralized water supply and actively develop village and township water-supply pipeline network optimized design techniques.

2.8.2 Encourage the research,development and popularization of village and township home-use water meters and water conservation facilities.In water-scarce areas,village and township water consumption should gradually be calculated on the basis of household size.

2.8.3 Develop village and township drinking water treatment and water quality supervision techniques.In areas where the water quality is not up to standard,drinking water sources should be treated on a concentrated basis.Set up water quality supervision systems.Encourage the development and popularization of simple supervision equipment and portable supervision equipment that conforms to village and township management conditions.

3. Industrial water conservation

Industrial water consumption mainly includes cooling water,water for heating power and craftwork and washing water.Among them,industrial cooling water consumption accounts for about 80 percent of total industrial water consumption.Its volume of fetched water accounts for 30-40 percent of total industrial fetched water.The volume of fetched water in eight industries including thermal power generation,iron and steel,oil,petrochemical,chemical,paper mills,textiles,non-ferrous metals,food and fermentation accounts for 60 percent of the national industrial fetched water (including direct cooling water for thermal power generation.)

3.1 Industrial water consumption repeated utilization techniques

Greatly developing and popularizing industrial water consumption repeated utilization techniques and enhancing the repeated utilization rate of water is a prime path for industrial water conservation.

3.1.1 Greatly develop circulated water systems,tandem water-consuming systems and water-returning and water-consuming systems.Push forward the development and application of enterprise water consumption network integration techniques.Optimize enterprise water consumption network systems.Encourage water exploitation and consumption network integration techniques in newly constructed,expanded and renovated projects.

3.1.2 Develop and popularize vapor condensation recovering and re-use techniques.Optimize enterprise vapor condensation recovering networks and develop closed recovering systems.Popularize the use of vapor condensation recovering equipment and devices.Popularize the water conservation steam trap that has a small blowing rate but big backpressure.Optimize the dust and oil removal techniques of vapor condensation.

3.1.3 Develop exterior wastewater drainage re-use and "zero-discharge" techniques.Encourage and support enterprise exterior wastewater (sewage) re-use after treatment.Greatly push forward the technique that re-uses exteriorly treated wastewater (sewage) in the recycling cooling water system.In areas that lack water and have a high ecological environment requirement,encourage enterprises to apply "zero-discharge" wastewater techniques.

3.2 Cooling water conservation techniques

Developing highly efficient cooling water conservation techniques is a key point of industrial water conservation.

3.2.1 Develop highly efficient heat exchange techniques and equipment.Popularize matter heat exchange water conservation techniques.Optimize heat exchange processes and the combination of heat exchangers.Develop new-type highly efficient heat exchangers.

3.2.2 Encourage the development of highly efficient environmentally friendly water conservation cooling towers and other cooling structures.Optimize recycling cooling water systems and speed up the elimination of cooling structures such as cooling pools and water-spraying pools that have low cooling efficiency and consume a lot of water.Popularize highly efficient new-type side-filters and eliminate inefficient counter-washing side-filter facilities that consume a lot of water.

3.2.3 Develop highly efficient cycling cooling water treatment techniques.In the open cycling indirect cooling water system,popularize water treatment operating techniques that have a concentration of more than four times.Eliminate water treatment operating techniques that have a concentration of less than three times.Restrict the use of hyper-phosphoric zinc water treatment techniques.Develop and apply environmentally friendly water treatment medicaments and prescriptions.

3.2.4 Develop air-cooling techniques.In areas that lack water and have proper climate conditions,popularize air-

cooling techniques.Encourage research and development into highly effective,economic air-cooling techniques and equipment.

3.2.5 Popularize and apply vapor-cooling techniques for high-temperature equipment such as reheating furnaces.Make full use of the vapor separated from water.

3.3 Heating power and technology system water conservation techniques

Water consumed in the heating power and technology systems used in industrial production is divided into boiler water-supply,vapor,hot water,purified water,softened water,desalinated water and deionized water.Its volume of water consumption takes second place in industrial water consumption,next only to cooling water.Saving heating power and technological systems' water consumption is a key part of industrial water conservation.

3.3.1 Popularize heat-unifying techniques for production technology (within and between devices,within and between working procedures).

3.3.2 Popularize the use of desalinated water for medium-pressure vapor equipment and the use of softened water for low-pressure vapor equipments.Popularize the use of closed cycle water-vapor sampling devices.Research and develop hot water boiler and vapor boiler water treatment techniques that can realize "zero-discharge",boiler vapor ash ejecting techniques and "zero-discharge" non-block wet desulfurization techniques.

3.3.3 Develop dry-style distillation,dry-style steam stripping,non-vapor de-oxygen techniques that use little or no vapor.Optimize vapor automatic adjustment systems.

3.3.4 Optimize the preparation technologies of boiler water supplies and technology water consumption.Encourage the adoption of up-stream recycling,bunk bed,washing water recovering techniques to reduce the volume of water consumption.Research and develop boiler water supplies,technology water consumption and the preparation of new technology and equipment and gradually popularize deionized water purification techniques.

3.4 Washing water conservation technique

In the process of industrial production,washing water is divided into product washing,equipment washing and environment washing water.

3.4.1 Popularize water conservation techniques and equipment of up-stream rinsing,sprinkler washing,vapor washing,aerial fog sprinkler washing,high pressure water washing,oscillation water washing,and highly efficient revolving panels.

3.4.2 Develop equipment-using water conserving washing techniques.Popularize recyclable detergents or all-in-one detergents and washing techniques.Popularize the technique of carbon dioxide ice washing,microorganism washing,sprinkler washing,water vapor pulse washing and non-stop in-service washing.

3.4.3 Develop environment water conservation washing techniques.Popularize the use of recycling water and self-cleaning coating techniques that have the function of photocatalysis and air catalysis.

3.4.4 Popularize various water washing auxiliaries and related chemicals that help reduce water consumption.Develop various highly effective environmentally friendly detergents,microorganism detergents and highly effective water washing machines.Develop and research non-water washing techniques and equipment such as environmentally friendly dissolvents,dry-cleaning machines and ionophore washing.

3.5 Industrial water-supply and sewage treatment water conservation technique

3.5.1 Popularize the use of new-type filter material high-precision filtration techniques and automobile backwash

techniques to reduce water consumption.Popularize the recycled use of backwash drained water and sedimentation tank mud water draining techniques

3.5.2 Encourage the application of ozone,ultraviolet light and other second pollution-free disinfection techniques during wastewater treatment.Develop and popularize the application of techniques such as supercritical water treatment,photochemical treatment,new-type biology,absorbent carbon adsorption,and membrane methods in industrial sewage treatment.

3.6 Unconventional water resource utilization techniques

3.6.1 Develop techniques for the direct utilization of seawater.Among industrial enterprises along the coastal area,greatly popularize seawater direct cooling and seawater recycling cooling techniques.

3.6.2 Actively develop seawater and bitter and salty water desalination treatment techniques.Implement industrial chain techniques that are mainly based on seawater desalination,as well as making salt out of bittern and extracting of other useful compositions.Enhance the comprehensive efficiency of seawater desalination.By expanding the scale of seawater desalination devices and implementing energy-recovering techniques reduce the costs of seawater desalination.Develop complete,serial and standard production techniques for seawater desalination equipment.

3.6.3 Develop mining well water resource utilization techniques during coal,oil and mineral extraction.Popularize the application of techniques for substituting water resources that turn mining well water into mining area industrial water,domestic water and agricultural field water.

3.7 Industrial water transfer pipeline network,equipment anti-seepage and rapid seepage-blocking techniques.

Reducing the water seepage rate of water transfer pipeline networks,water-using pipeline networks,and water-using equipment (appliances) is a main path towards industrial water conservation.

3.7.1 Develop new-type water transfer materials.Restrict and gradually eliminate traditional cast iron and galvanizing pipelines and speed up the development of water pipelines that have strong mechanical strength,rigidity and are convenient for installation.Develop valves and pipeline components that are non-leaking,convenient for operation and supervision and have a long service life.

3.7.2 Optimize techniques for industrial water supply pressure,liquid surface and water volume control.Develop swift,practical industrial water pipeline networks and equipment (appliances),leakage examination equipment,and instruments and technology.

3.7.3 Research and develop rapid leakage-blocking techniques for pipeline networks and equipment (appliances).

3.8 Industrial water consumption quantitative management techniques

Industrial water consumption quantity and control is foundational work for progress in water consumption measuring,management and water conservation techniques.

3.8.1 Key water consumption systems and equipment should have water meters and control instruments installed.Perfect and revise related various design specifications.Affirm the design and installation of water quantity measuring and supervision instruments and their precise requirements.Key water consumption systems and equipment should gradually have improved computer and auto-supervision systems.

3.8.2 Encourage and popularize the establishment of enterprise water consumption and water conservation computer management systems and databases.

3.8.3 Encourage the development and production of control instruments such as new-type industrial water quantity

measuring instruments,volume-limited water meters and time-restricted controls,water-pressure controls,water-level controls and water-level sensor controls.

3.9 Key water conservation technology

Water conservation technology refers to the technology that uses less water or does not use water by changing production raw materials,techniques and equipment or the ways of water consumption.It is the highest level (water conservation,energy-saving and product quality enhancement) of all source water conservation techniques.

3.9.1 Greatly develop and popularize water conservation techniques and equipment such as industrial dry dusting and dry dust (slag) transfer,high-density dust/slag transmission,dust-washing water recycled in the industries of thermal power generation,iron and steel and calcium carbide,and the dry dust-collection purification techniques in smelters.

3.9.2 Popularize gas-vapor unified recycling power generation,clean-coal burning power generation techniques.Research and develop power-generation technology and techniques that consume less water such as the use of petrochemical fuel including natural gas for power generation.

3.9.3 Popularize non-blast furnace iron-smelting techniques using melted reduce in the iron and steel industries.Develop thin-belt continuous casting techniques.Popularize dry coke-extinction or low-water coke-extinction techniques in the process of coking.

3.9.4 Encourage hydrogen-adding refining technique and eliminate acid-base washing techniques in the process of refining oil products.

3.9.5 Develop water conservation techniques in the production of synthetic ammonia.Use low energy-consuming decarbonization techniques to replace water-washing de-carbon dioxide and use low-heat consuming Benfiledtechniques and MDEA decarbonization techniques.Popularize complete low-changing techniques,NHD de-sulfur,decarbonization gas purification techniques.Develop ammonia-production which uses natural gas as a raw material.Popularize alcohol hydrocarbon refineries and low-pressure low-energy-consuming ammonia combination systems.Produce synthetic ammonia with heavy oil as raw materials and use dry-retrieving druses.

3.9.6 Develop urea production water conservation techniques.In newly-built plants,popularize CO2 and NH3 stream stripping techniques.Popularize water solution complete recycling urea energy-saving and water conservation techniques.In medium and small-sized urea plants,popularize urea waste liquid deep hydrolyzation desorption techniques.

3.9.7 Popularize methanol production low-pressure synthetic techniques.

3.9.8 Develop caustic soda production water conservation techniques.Popularize ion-membrance caustic soda and use three-effect up-stream evaporation to renovate traditional down-stream evaporation.Popularize 10,000-ton three-effect up-stream evaporation plants and highly effective natural imperious recycling evaporators.

3.9.9 Develop sodium carbonate production water conservation techniques.In ammonia-soda plant,popularize vacuum distillation and dry dust-adding techniques.

3.9.10 Develop the acid-washing purification technique in the production of sulphuric acid and new-type heat-exchange equipment.Gradually eliminate water-washing purification techniques and traditional cast iron cooling pipelines.

3.9.11 Develop textile production water conservation techniques.Popularize the use of highly effective water conservation auxiliaries.Popularize the use of biological enzyme treatment techniques,highly efficient short-range pre-

treatment techniques,cold rolling pre-treatment techniques,dye-bath new techniques,low-water up-stream rinsing techniques and high-temperature high-pressure small bath-ratio liquor-stream dye-bath technology and equipment.Research and develop high-temperature high-pressure stream dyeing,micro-suspension particle dyeing and low-temperature plasma processing technology and equipment.Encourage textile dyeing processing enterprises to use natural color cotton water conservation production raw materials and popularize natural color cotton new-type manufacturing techniques.

3.9.12 Develop paper industry chemical slurrying water conservation techniques.Popularize fiber raw material washing water recycling technique systems.Popularize lowKappa value stewing,pre-rinsing oxysome de-lignin treatment,closed washing and screening systems.Develop non-element chlorine or complete non-chlorine bleaching.Research and develop low-chlorine bleaching and complete non-chlorine bleaching that suits the character of straw pulp.Reasonably organize the up-stream use of bleaching wash filtered liquid.Popularize medium and thick techniques and the process intelligent control technique.Develop and enhance soda recycled black liquid multi-effective evaporation stations and secondary vapor cooling water recycling rate techniques.Develop the pulp-making water recycling use technique for mechanic pulp,secondary fiber pulp.Popularize highly effective precipitation filtration equipment "saveall" recycling techniques.Strengthen "saveall" closed circular technique research.Develop re-use technique and equipment for "saveall" recycle and mid-wastewater after second-grade biochemical treatment.

3.9.13 Develop food and fermentation industry water conservation techniques.Develop dry,semi-wet and wet preparation starch water extraction closed circular flow techniques according to different products and different technologies.Popularize water extraction closed circular flow techniques for the production of alcohol with mould adobe blocks corn powder,the production of gourmet powder and lemon acid with starch.Popularize high-density sweetwort fermentation (alcohol,beer,gourmet powder,yeast and lemon acid) and high-density mother liquor (gourmet powder) extraction techniques.Popularize concentration techniques by using double-plus effect evaporator.Eliminate the technique for starch raw material of high-temperature stewing and pasting,low-density sugar liquid fermentation,low-density mother liquid extraction.Research and develop beer wheat juice cooling,and alcohol differential pressure distillation devices.

3.9.14 Develop oilfield water conservation techniques.Popularize optimized water injection techniques and reduce ineffective water injection.For extremely high water-content stage oilfields,technical measures of thin-layer water injection and thin-layer water blocking should be taken to control the volume of water injected.Popularize advanced and suitable oilfield water treatment re-injection techniques.For water from those especially low and penetrated oilfields,popularize refined treatment techniques.For thick-oilfields that need to inject stream,popularize thick oil sewage deep treatment re-use stream injection boiler techniques.Research and develop treatment and re-use techniques for water extracted from the third exploration of oilfield.Popularize oil and gas field construction and under-well work water conservation techniques.

3.9.15 Develop coal production water conservation techniques.Popularize effective water-preservation measures in the process of coal exploration and prevent mine pit leakage or oozing.Develop and apply advanced exploration technology and equipment that cause less damage to surrounding rocks and water loss.Develop and apply water conserving coal selection equipment.Develop and apply dry coal selection techniques and equipment.Research and develop large-scale advanced dehydration and coal earth water treatment equipment.

3.9.16 Popularize new-type dry production technique of decomposition outside cement kilns.Gradually eliminate wet production techniques.

4. Urban domestic water conservation

Urban domestic water consumption includes water used by urban residents,commercial and trade firms,institutions,colleges and universities,tourism,social services,gardening and afforestation.At present,urban domestic water consumption accounts for about 55% of urban water consumption.Along with the development of the cities,urban domestic water consumption will further increase; urban domestic water consumption is closely linked to the daily life of common people,with a per capita water consumption 212 liter/per day (Of which,228 liter/per day in municipal cities.Urban domestic water conservation is of significant important for the promotion of building water-conserving cities.

4.1 Water conservation appliances

The popularization and application of water conservation water-consumption utilities is a key technical guarantee of domestic water conservation.

4.1.1 Popularize water-conserving taps.Popularize water-conserving taps such as the non-contact auto-control,prolong time automatic close,water cut-off automatic close,foot-treading,ceramic-chip-sealed taps.Eliminate iron cast spiral water taps,iron cast spiral valves in construction.

4.1.2 Popularize water-conserving toilet systems.Popularize the use of two-level toilets.The toilet water volume in the new buildings should be less than 6 liters.In public construction areas,two-level toilets with a water volume of 6 liters are preferred.Urinals with non-contact control devices need to be popularized.Eliminate sanitary ware with water infusion on the tank lower than the water level,with water pumped up and flashed down,or with a water-flashing volume of more than 9 liters.

4.1.3 Popularize water conservation bathing facilities.Bathrooms commonly use bathing facilities with hot- and cold-water mixing taps.Popularize the use of intelligent card non-contact auto-control,prolong time automatic close,foot-treading showering devices.For hotels,restaurants and hospitals which consumer great amounts of water,popularize the use of bathing devices with restricted water flows.

4.1.4 Research and produce new-type water conservation appliances.Research and develop highly intelligent water appliances,water appliances with ideal water consumption volumes and household-use water taps with different functions.

4.2 Urban recycled water utilization techniques

Urban recycled water utilization techniques include urban sewage treatment recycled water use techniques,construction water treatment recycled water use techniques and living sewage treatment recycled water use techniques.

4.2.1 Set up and perfect urban recycled water use technique systems.Urban sewage recycled water use should follow the principle of local use for the area where the treatment is handled according to the source and scale of urban sewage while using reasonable recycled water treatment technology and transfer technology.Encourage the research and enactment of urban water system plans,recycled water use planning and technology standards.Gradually optimize urban water supply systems and water pipeline distribution networks.Set up urban recycled water use pipeline networks coordinated with urban water systems and centralize the recycled water use system for water from treatment

plants,single construction sites and residential zones.Stipulate and perfect sewage recycled utilization standards.

4.2.2 Develop sewage concentration treatment recycled use techniques.Encourage cities that are lacking water resources to concentrate on sewage treatment plants and adopt recycled water use techniques.Recycled water can be used for agriculture,industry,urban grasslands,rivers and lake landscapes,car-washing,underground water supplementing and be used in public construction covered by the urban sewage concentration treatment re-use pipeline network.

4.2.3 Popularize and apply urban residential zone recycled water use techniques.Water-scarce areas,residential zones,should adopt construction water treatment re-use techniques if the construction scale,population and water consumption reach a certain level.Recycled water can be used for toilet flushing,cleaning,car-washing,green land,environmental and ecological uses.

4.2.4 Popularize and apply middle water treatment re-use techniques.For water-scarce areas and areas outside the coverage of urban sewage concentrated treatment re-use pipeline networks,if construction water consumption reaches a certain level,construction middle water treatment re-use techniques should be actively adopted.Middle water can be used as domestic water.

4.2.5 Actively research and develop highly efficient and low energy-consuming sewage treatment and recycled water re-use techniques.Encourage the research and development of new treatment techniques and recycled water use techniques that take small space,are highly automated,easy to operate and maintain and low in energy consumption.

4.3 Urban rainwater,seawater,bitter and salty water use techniques

4.3.1 Popularize urban rainwater direct use techniques.In urban grasslands and residential areas,popularize urban grassland water-storage direct use technique.Rainwater can be directly used for grassland watering.In water-scarce areas,popularize road rainwater collection direct use technology.The rainwater collected by the roadside can mainly be used for urban use.Encourage dry area cities to adopt micro water conservancy project techniques to make use of the rainwater resource that is in small intensity by widely distributed in accordance with their own conditions such as roof rainwater collection technique.

4.3.2 Popularize urban rain environment ecological use techniques.Combine rain use with protection and restoration of wetland such as natural low-lying land,lakes and rivers in parks.

4.3.3 Promote urban rainwater collection and pumping-back technology.Priorities should be given to the promotion of urban rainwater collection and pumping-back technology in areas short of water.Make full use of rain flood and flood-period water release from reservoirs to have underground water pumped back and reutilized through the grassland,urban water system,water-penetrating roads in urban transportation networks,roadside drainage,urban community rainwater storage and utilization systems and water collection£¬penetration and replenishment and utilization systems in public buildings.Improve urban drainage systems and launch rainwater runoff collection systems and water quality supervision systems.Encourage areas that lack water to use urban water collection and pumping-back systems on the basis of systems that divide rainwater from sewage. Research and develop rainwater quality monitoring systems in urban areas.

4.3.4 Promote seawater utilization technologies.In northeastern,northern and eastern coastal cities where water is scarce,actively develop seawater desalination and transportation and dispatching technology£¬speed up in developing low cost seawater desalination technology.Encourage these cities to develop seawater direct utilization techniques

and actively develop processing technologies for salty daily-life sewage water.Develop technologies for the disposal of salty sewage water into the sea (ocean).

4.3.5 Promote systems utilizing bitter and salty waters.In water-scarce cities in north and northwestern and coastal regions,we should actively promote electro-dialysis disposal processing technology and anti-permeation processing technology and apply them to the disposal of urban varied water use and daily life varied water use and part of the drinking water use.

4.4 Leak-hunting and anti-seepage technologies in the urban water-supply pipeline network.Water leakages in the urban water-supply pipeline network have become a problem in the current urban water supply.Actively adopting leak-hunting and anti-seepage technologies is not only an important technical measure in saving urban water resources,but will also play a significant role in improving the service quality of the urban water-supply and ensuring the safety of the supplied waters quality.

4.4.1 Promote pre-locating leak-hunting and precise leak-hunting locating technologies.Promote and apply pre-locating leak-hunting and precise leak-hunting locating technologies,optimize leak-hunting methods in line with the different building conditions of the water-supply pipeline networks.For networks buried under the earth,adopt passive leak-hunting method mainly,and use active leak-hunting method as a supplement.For networks covered with urban roads, active leak-hunting method and adopt passive leak-hunting method as a supplement.Encourage the adoption of area leak census system technology and precise-locating leak-hunting technology,on the basis of the construction of the GIS and GPS systems for the urban water-supply pipeline networks.

4.4.2 Promote the use of new tubular products.For big-caliber tubular (DN>1200),give priority to pre-stressed concrete cylinder pipes; for middle-caliber tubular (DN=300-1200),give priority to plastic or ductile iron pipe,and gradually discard ferro-steel pipes.For small-caliber tubular (DN<300),give priority to plastic pipe,gradually discard galvanized iron pipe.

4.4.3 Promote and apply advanced techniques in water-supply pipe linkage and antisepsis.Under normal condition,socket joints should adopt rubber-ring sealed flexible linkage technology.The inside wall of metal pipes should adopt the antisepsis technique of applying cement plaster or resin.As for welded or glued pipes,adopt relative construction technologies such as proper distance installing flexible interfaces,expansion pipes or U-typed pipes in consideration of pipe harmomegathus.

4.4.4 Encourage the development and use of piping leak-hunting determination and supporting information systems.Encourage the launch of the determination and supporting systems with the functions of artis-searching,condition emulation,incident analysis decision-making and dispatching,on the basis of the GIS system of pipeline network construction.These will provide technical support for determining the location of pipeline network leaks.

4.5 Water conservation techniques for public water-supply enterprises.

Water conservation of the public water-supply enterprises should mainly be focused on the recycling of backwashing waters.The recycle of backwashing waters should meet both urban water conservation and water environment protection targets.

4.5.1 For newly-built or expanded water-supply projects which uses surface water as primary water,actively promote backwashing recycling techniques.Choose new filtering technologies with strong waster entrapment capacities,build

backwashing desilters,and adopt air-driven backwashing technologies,which are more effective with a low backwashing volume.

4.5.2 In the renovation of water-supply projects,actively adopt advanced backwashing technologies.Reform and strengthen the structural organs of the backwashing system,adopt adequate backwashing methods,and improve the backwashing recycling functions of the desilters.Discard high-intensity timing backwashing techniques by 2008.

4.6 Water conservation techniques for public buildings

With the fast development of urbanization and the service sector,water demands in public buildings will rise sharply.Water conservation in air-conditioners should be regarded as one focus of water conservation in these buildings.

4.6.1 Promote circular chilling techniques for air-conditioners in public buildings.The air-conditioners in public buildings should adopt circular water-chilling systems,the recycling rate of the chilled water should be above 98%.The concentration of the chilled water in open-form systems should be no less than three times.Circular water-chilling systems should be in open or closed form in line with actual conditions.

4.6.2 Promote and apply antiseptic,anti-fouling and anti-microbe techniques in air-conditioner circular water-chilling systems.

4.6.3 Encourage the adoption of air-chilling techniques

4.6.4 Promote and apply boiler condensation recycling techniques.Promote and apply close-end condensation recycling systems,hot-pump condensation recycling system,compressor wastewater recycling system,fixed-climate pressure water returning machine,the recycling rate of directly using condensation water no less than 85%.Develop antiseptic and water-quality monitoring systems for recycled machinery.

4.7 Water conservation techniques in municipal environment

The water usage in municipal environment accounts for an increasing part of urban water demand.Encourage biotech water conservation techniques,and adopt comprehensive techniques combining biotech water conservation and management,to better promote water conservation in municipal environment.

4.7.1 Develop afforestation water conservation techniques.Actively develop biotech water conservation,promote the planting of drought-enduring forests,and use non-sufficiency irrigation method in irrigation.Use recycled water in afforestation.For those who use non-recycled water,adopt water conservation techniques such as sprinkling irrigation,micro sprinkling and dipping irrigation.Select earth buried rise-fall sprinkling irrigation facilities,dipping irrigation pipes,micro sprinkling irrigation head and dipping irrigation belt in afforestation efforts.

4.7.2 Develop water-recycling techniques in scenic spots.

4.7.3 Promote water-recycling techniques in swimming pools.

4.7.4 Develop water conservation techniques for car washing.Promote and apply water conservation techniques for car washing,promote the usage of high-pressure gun-jet for washing vehicles,computerized car-washing and micro-water washing.Research and develop environmentally friendly water-free washing techniques.

4.7.5 Actively push forward non-flushing toilet facilities and other water conservation toilets

4.8 Information on techniques for urban water conservation.

Water conservation information technology,which could realize water conservation information sharing and enhance scientific decision-making concerning water conservation matters,is of great significance in strengthening water-

conservation management.

4.8.1 Develop the applied technology of geographic information systems (GIS).Encourage researches on GIS-based water conservation information systems so as to provide a solid foundation for urban water conservation information management.

4.8.2 Develop water conservation information-gathering and transmitting technology and specialized database technology.Develop internet-based water-conservation information technology and water conservation management systems and specialized database technologies in order to enhance and regulate water conservation management and guide the development of urban water conservation techniques.

5 Guarantee measures to develop water conservation technology.

Improve laws and regulations and set up incentive and constraining mechanisms and perfect a well-functioning technology service system in order to push forward the development and application of water conservation technology.

5.1 Strengthen legislation work and administrative management on water conservation.

5.11 In accordance with the Water Law of the People's Republic of China and the Law on Clean Production of the People's Republic of China and other legislation,laws and regulations concerning the promotion of water conservation technology development should be enacted.

5.1.2 The progress of water conservation technology should be placed in an important position when central or local governments are drafting their "11th Five Year" Development Plan or other specific socioeconomic plans.

5.1.3 Research and development (R&D) into major water-conservation technologies should be incorporated into the country's medium and long-term science and technology development planning and into national science and technology development plans as well.

5.1.4 The central government will regularly issue "categories of outdated high-water consumption techniques and equipment that are to be abandoned" and "categories of water conservation production techniques and equipment to be promoted".

5.2 Establish incentive and constraining mechanisms for developing water-conservation technology.

5.2.1 Both the central and local governments should attach importance to the development,showcasing and promotion of these vital water conservation technologies,and offer the necessary financial backing.

5.2.2 Products made from wastewater (liquid) and conforming to 2003 Versions of Lists of Resources for Comprehensive Utilization could enjoy reduced income tax rates according to national policies.

5.2.3 Encourage industries that make good use of alternative water resources such as recycled water,seawater and minimum salty water.Enterprises that produce water from recycled water or enterprises that produce fresh water from seawater are entitled to enjoy preferential policies.

5.2.4 Water conservation technology and equipment encouraged by national policy are entitled to enjoy preferential taxes as permitted by national policies.

5.2.5 Water conservation projects,whether undertaken by the State,local governments or enterprises,should first choose their water conservation techniques and equipments as recommended by the Outline.For some important projects,the State and the local governments should provide fund subsidies support.

5.2.6 Guide social investment to water conservation projects,with special emphasis on leading financial institutions to grant loans to some key projects.Encourage diversified financing formula so as to provide sufficient funds for the technological renovation of water conservation projects and the funding for water conservation projects.

5.2.7 Building water pricing mechanisms that fully reflect China's scarcity in water resources.Its emphasis lies on water conservation,the allocation of water resources,efficiency in water usage and the sustainable use of water resources.Under the revised pricing mechanism,the number of people who should pay for water consumption is enlarged and the amount they are paying will see a moderate hike.The price of water used in water conservancy programs will also meet a steady increase.The price hike priority should be given to urban sewage treatment and water recycling.Promote laddering water price to make the pricing mechanism more scientific and reasonable,people should be more heavily charged if water consumption exceeds the prescribed quota.

5.2.8 Water conservation technologies recommended in the Outline should be actively adopted in all projects that are newly built,or being extended,or being rebuilt.In this regard,all water conserving facilities should be designed,built and operated at the same time as those of the main building construction.All water consuming entities should make sure that their water consumption plan,water conservation target,water conservation measures and water management system are all in place.

5.2.9 Establish and improve water consumption control and quota management systems.Establish evaluation and appraisal systems for fetched water quotas in combination with characteristics of industries and regions.

5.2.10 Strengthen the inspection and supervision of key water consuming companies,so that they will carefully observe the water quota,adopt water conservation technologies and products and discard outdated and highly water-consuming manufacturing techniques and equipment.All newly built water-consuming projects are not allowed to use the outdated techniques and equipments listed in the Outline.

5.2.11 Speed up the establishment of a water conservation products warrant system and water product market regulations.

5.3 Establish and complete a research development and service promotion system on water conservation technologies.

5.3.1 Reinforce the system of water conservation technology renovation through the establishment of more laboratories and research centers with expertise in developing water conservation technologies.

5.3.2 Strengthen the popularization of services and systems that conserve water.Organize a variety of related activities,such as technology exchanges,promotions,consultations,information releases,advertisements and training courses.

5.3.3 Strengthenthe systemization of water conservation standards.Establish and improve various standards on water quotas,water conservation basis,water conservation evaluation,and water-conservation-related equipment,products standards and technology specifications.

5.3.4 Promote international exchange and cooperation on water conservation technology on more regular basis.Exchange and cooperation activities include the introduction and adoption of leading foreign technologies concerning water conservation and the research and development of such technologies and products with our own intellectual property.

5.3.5 Launch education campaigns that aim to promote water-conservation related issues,such as science

popularization and promotion programs on water-conservation technologies in a varied and effective forms.

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