



**THE US-CHINA BUSINESS COUNCIL**

美 中 贸 易 全 国 委 员 会

## 外商投资产业指导目录

### **Catalogue Guiding Foreign Investment in Industry (2011 Revision)**

National Development and Reform Commission  
and Ministry of Commerce

December 24, 2011

*(Note: This is an unofficial translation by the US-China Business Council, to be used for reference only.  
The official Chinese-language version is the authoritative version.)*

#### **US-China Business Council Notes and Abbreviations**

Any investments not listed in the three categories below (encouraged, restricted, and prohibited) fall into the fourth category of “permitted invested industries” as outlined in the Regulation on Guiding Foreign Investment Direction (指导外商投资方向规定) (State Council Order 346).

CJV: Cooperative joint venture

EJV: Equity joint venture

R&D: Research and development

The catalogue uses two separate phrases to indicate restrictions on foreign ownership:

- “Chinese side must hold a controlling interest” indicates that the combined stake of all Chinese investor(s) is more than 50% of the enterprise (and greater than the combined stake of all foreign investors).
- “Chinese side must hold the largest relative controlling interest” indicates that the combined stake of all Chinese investor(s) is more than 50% of the enterprise and that at least one Chinese stakeholder holds a large stake than any single foreign shareholder.

# Encouraged Foreign Investment Industries

## I. Agriculture, Forestry, Animal Husbandry, and Fishery

1. Cultivation, development, and production of woody edible oils, spices, and industrial raw materials
2. Development of cultivation technology and production of green, organic vegetables (including edible mushrooms and melons), dried and fresh fruits, and tea
3. Development of new cultivation technology and production of crops such as sugar-yielding crops, fruit trees, and foraging grass
4. Production of flowers and plants; construction and management of nursery gardens
5. Planting of rubber trees, oil palm, sisal hemp, and coffee
6. Cultivation and breeding of Chinese medicinal crops (limited to CJVs and EJVs)
7. Recycling and multipurpose utilization of straw; development and production of organic fertilizer resources
8. Planting and cultivation of forest trees (bamboo) and fine strains of forest trees, cultivation of new varieties of trees such as polyploid trees
9. Breeding of aquatic fingerlings (excluding special, precious, or good strains from China)
10. Construction and management of ecological environmental protection projects, such as planting trees and grass to prevent and rectify desertification and soil erosion
11. Breeding of aquatic products, deep-water and net-cage culture products, and industrialized aquatic products; cultivation and breeding of ecological ocean species

## II. Mining

1. Exploration and development of coal bed methane; use of mining gas (limited to CJVs and EJVs)
2. Exploration and development of oil and natural gas (limited to CJVs and EJVs)
3. Development of low-permeation oil and gas fields (deposits) (limited to CJVs and EJVs)
4. Development and application of new and other relevant technology to increase crude oil extraction (limited to CJVs and EJVs)
5. Development and application of new technology in oil exploration and development, such as exploring, drilling, well logging, measuring while logging, and down-hole operations (limited to EJVs and CJVs)
6. Exploration and development of oil shale, oil sand, heavy oil, ultra heavy oil, and other non-conventional oil resources (limited to EJVs and CJVs)
7. Exploration, mining, and extraction of iron and manganese ore
8. Development and application of new technologies to increase the use of mining debris; comprehensive application of mine reclamation technology
9. Exploration and development of unconventional natural gas resources such as shale gas and seabed gas hydrate (limited to CJVs and EJVs)

## III. Manufacturing

### *(1) Agricultural food processing*

1. Development and production of biological feed, straw, and aquatic feed
2. Processing of aquatic products, purification and processing of shellfish, and development of seaweed health foods
3. Processing of vegetables, dried and fresh fruits, poultry, and livestock products

### *(2) Food manufacturing*

1. Development and production of food for babies and seniors and health food
2. Development and production of forest foods
3. Production of natural food additives and ingredients

(3) *Beverage manufacturing*

1. Development and production of fruit and vegetable, protein, tea, coffee, and plant beverages

(4) *Tobacco processing*

1. Cellulose diacetate fiber and strip processing (limited to CJVs and EJVs)

(5) *Textiles*

1. Production of lightweight, high-strength, and high/low temperature-, chemical-, and light-resistant textiles using non-woven, woven, knitted, and composite technologies
2. Weaving, dyeing, and final processing of high-quality fabric using advanced technology and equipment to conserve energy and reduce emissions
3. Processing of special natural fibers that comply with the requirements of ecology, comprehensive resources use, and environmental protection (including cashmere and other specialty animal fibers, hemp, natural silk, and colored cotton fibers)
4. Production of apparel that uses computer-integrated manufacturing systems
5. Production of apparel that ensures clothing functionality, and environmental friendliness, and production of special clothing
6. Production of high-quality carpets, drawnwork, and embroidery

(6) *Leather, fur, and feather processing*

1. Processing of leather- and fur-cleaning technology
2. Processing of new technology for leather finishing
3. Processing of high-quality leather
4. Comprehensive utilization of leather waste

(7) *Timber processing, bamboo, rattan, palm, and grass products manufacturing*

1. Development of new technology and manufacture of new products for the comprehensive utilization of logging, cutting, and processing remains as well as “sub-quality, small, and firewood” lumber and bamboo

(8) *Papermaking and paper product industry*

1. Production of chemical wood pulp derived from overseas lumber with single assembly line capacity of 300,000 tons or more annually and chemical mechanical wood pulp with single assembly line capacity of 100,000 tons or more annually, as well as high-quality paper and cardboard produced simultaneously (limited to CJVs and EJVs)

(9) *Petroleum processing, coking, and nuclear fuel processing industry*

1. Deep-processing of needle coke and coal tar

(10) *Chemical raw materials and chemicals manufacturing*

1. Development and production of new downstream products of sodium-process calcium hypochlorite (CAPO), polyvinyl chloride (PVC), and organosilicone
2. Material that forms a complete set of composite material: production of propylene oxide manufactured by hydroperoxidation using hydrogen peroxide; glycerol epichlorohydrin; dimethyl naphthalene (NDC); 1,4-cyclohexane dimethanol (CHDM)
3. Synthetic fiber material: manufacture of caprolactam, adipic acid hexamethylenediamine salt, spandex resin manufactured by melt spinning, and 1,3-propanediol
4. Synthetic rubber: solution styrene butadiene rubber (not including thermoplastic styrene-butadiene rubber), cis-rich polybutadiene rubber butyl rubber, isoprene, neoprene, den flex,

- acrylic rubber, chlorohydrin rubber, ethylene propylene diene monomer (EPDM), fluoro rubber, silicone rubber and other types of special rubber production
5. Plastics engineering and plastic alloy manufacture: manufacture of non-phosgene polycarbonate (PC) with an annual capacity of 60,000 tons and above, polyoxymethylene (POM), polyamide (nylon 6, nylon 66, nylon 11 and nylon 12), ethylene-vinyl acetate copolymer (EVA), engineering plastics nylon 11 and nylon 12, polyphenylene sulfide (PPS), polyether ether ketone (PEEK), polyimide, polysulphone, polyether sulfone, bisphenol-A polyarylate (PAR), and liquid crystal polyarylate
  6. Fine chemicals industry: new products and technologies of catalysts, dyestuff (pigment) commercialization processing, electronic chemicals and paper-making chemicals, food additives, feed additives, leather chemicals (excluding N-N dimethylformamide), oil additives, surface activators, water treatment compounds, adhesives, inorganic fibers, inorganic nano-materials manufacturing, and deep processing of pigments and coatings
  7. Manufacture of environmentally friendly printing ink and aromatic hydrocarbon oil
  8. Manufacture of natural perfume, synthetic perfume, and perfume isolates
  9. Manufacture of high-performance paint, water-based paint for automobiles, and water-based resins
  10. Manufacture of chlorofluorocarbon (CFC) substitutes
  11. High-performance fluorine resin, fluorine coated materials, fluorinated intermediates for medical use, and environmentally friendly refrigerants and detergents
  12. Manufacture of fluorine resources recycled from phosphorus chemical processing and aluminum smelting
  13. Development and manufacture of new chemical technologies and products for the forestry industry
  14. Development and manufacture of organic, inorganic, and bio-membranes for environmental protection
  15. Development and manufacture of new types of fertilizers: biological fertilizers, highly concentrated potash fertilizers, compound fertilizers, slow- or controlled-release fertilizers, compound microbial inoculants, compound microbial fertilizers, mature straw and trash compost, and microbial products for special functions
  16. Development and manufacture of new pesticides, delivery methods, special intermediates, and additives that are efficient, safe, and environmentally friendly; development and application of related clean production processes (methylene method of acetochlor, paraquat amine cyanide method, water process chlorpyrifos, glyphosate, methyl chloride recovery process, directed synthesis and three-dimensional structure of chiral pesticides production, synthesis of ethyl chloride technology)
  17. Development and manufacture of bio pesticide and bio-control products: microbial pesticides, microbial sanitizers, agricultural antibiotics, insect pheromones, natural enemies of insects, and microbial weed-control chemicals
  18. Multi-purpose use, disposal, and treatment of exhaust gas, waste liquid, and industrial waste products
  19. Manufacture of organic high-polymer materials: coating paint for airplanes, rare-earth cerium sulfide red dye, lead-free electronic sealing and packaging materials, special series of lithography slurry for color plasma display, ultra-fine fiber, high-precision fuel filter paper, and Li-ion battery separator

*(11) Medicine manufacturing*

1. Manufacture of new types of compound medicine or medicine with active ingredients (including raw materials for medicine and preparation)
2. Amino acids: manufacture of fermented tryptophan, histidine, and amino acids for the feed industry

3. Manufacture of new anti-cancer medicines; new heart, brain, and blood vessel medicines; and new neurology medicines
4. Manufacture of new medicines using bio-engineering technology
5. Manufacture of AIDS vaccine, hepatitis-C vaccine, contraceptives, and new vaccines such as those for cervical cancer, malaria, and hand-foot-and-mouth disease
6. Manufacture of bio vaccines
7. Development and manufacture of oceanic medicines
8. Pharmaceuticals: manufacture of new-forms of pharmaceuticals and new products that use new technologies and delivery mechanisms such as slow release, controlled release, targeting, and absorbing through surfaces
9. Development and manufacture of new pharmaceutical adjuvants
10. Manufacture of anti-bacterial material medicines for animals (including antibiotics and chemical-compounds)
11. Development and manufacture of new antibiotic, anthelmintic, insecticide, and anti-coccidiosis medicines and delivery mechanisms for animal use
12. Manufacture of new diagnostic reagents

*(12) Chemical fiber manufacturing*

1. Manufacture of differentiated chemical fibers and high- and new-tech fibers (except for viscose fiber) such as aramid fiber, carbon fiber, and high-strength and high-modulus polyethylene, and polyphenylene sulfide (PPS)
2. Manufacture of new fiber and non-fiber polyesters: polytrimethylene terephthalate (PTT), polyethylene naphthalate (PEN), polycyclohexylenedimethylene terephthalate (PCT), glycol modified polyethylene terephthalate (PETG)
3. Application of new renewable resources and green biomass fiber production processes, including new solvents from cellulose fibers (Lyocell), regenerated cellulose fiber such as bamboo, hemp, and other raw materials, polylactic acid (PLA), chitin fiber, polyethylene-based fatty acid ester fibers (PHA), animal and plant protein fibers
4. Manufacture of polyamides with single-machine daily capacity of 150 tons or more
5. Manufacture of radial tires from aramid fibers and cords

*(13) Plastics*

1. Development and manufacture of new optical multi-functional wide agricultural film
2. Cleaning up and recycling of disposed plastic
3. Development and manufacture of new plastic soft-packaging technology and products (high-separation, multi-purpose membrane, and raw materials)

*(14) Non-metal mineral product manufacturing*

1. Development and manufacture of building materials that are energy-saving and environmentally friendly and that reuse waste, are lightweight, high performing, and multi-functional
2. Manufacture of energy-saving, high-efficiency chemical construction materials that can replace steel and wood
3. Manufacture of modified asphalt waterproof roll material with an elastic or plastic body and a normal production of 10 million m<sup>2</sup> or more, ethylene propylene rubber with a width of 2 meters or more, polyvinyl chloride (PVC) waterproof rolls with a width of 2 meters or more, and thermoplastic olefin (TPO) waterproof roll material
4. Development and manufacture of functional glass with new technology: electromagnetic shield glass, glass substrates for microelectronic applications, lead-free infrared transmitting glass, electronic-grade large-scale quartz glass products (tubes, plates, crucibles, equipment, and utensils), multi-functional windshield glass with exceptional optical performance, extreme materials and products that use information technology (including high-precision, waveguide-

- level quartz glass optical fiber tubes and ceramic substrates), and high purity ( $\geq 99.998\%$ ) ultra-pure ( $\geq 99.999\%$ ) crystal purification processing of raw materials
5. Manufacture of conductive glass with thin film batteries, solar microscope glass
  6. Manufacture of fiberglass products and special fiberglass products: low-dielectric fiberglass, quartz fiberglass, high-silica fiberglass, high-strength and high-elastic fiberglass, and ceramic fiber and its products
  7. Manufacture of optical fibers and related products: medical image bundles and laser fibers, super second- and third-generation micro-channel plates, optical fiber panels, image inverters and glass light cones
  8. Manufacture of ceramics used as high-grade decorative material made with refined new porcelain materials
  9. Manufacture of cement, electronic glass, ceramics, microporous charcoal bricks, and other environmentally friendly refractory materials (without chromium) that are used for kilns
  10. Manufacture of aluminum nitride (AlN) ceramic base chip, and porous ceramics
  11. Manufacture of inorganic, non-metal new material and products: composite materials, special types of porcelain, special types of sealing material (high-speed oil sealing materials), special types of friction material (high-speed friction brake products), special types of glue materials, special types of latex materials, sonar rubber products, and nanomaterials
  12. Manufacture of organic-inorganic composite foam insulation materials
  13. Manufacture of high-tech compound materials: compound and pre-preg materials with continuous fibers and enhanced thermo plasticity, key auxiliary materials for resin compounds with temperature durability of  $300^{\circ}\text{C}$  or above, resin base compound material (including high-end sports goods and lightweight, high-strength transportation tool components), compound materials and products with special functions (including compound deep water and diving material and products, compound materials and products for medical and health recovery use), carbon/carbon compound materials, high-performance ceramic compound material and products, metallic compound material and products, metallic stratum compound materials and products, high-pressure compound tube (pressure  $\geq 320\text{MPa}$ ), and aviation tires for large passenger airliners
  14. Manufacture of high-quality ceramics raw materials: super-fine silicon carbide (SiC) powder (purity  $>99\%$ , average grain size  $<1\mu\text{m}$ ), super-fine silicon nitride ( $\text{Si}_3\text{N}_4$ ) powder (purity  $>99\%$ , average grain size  $<1\mu\text{m}$ ), high-purity super-fine aluminum oxide powder (purity  $>99.9\%$ , average grain size  $<0.5\mu\text{m}$ ), low-temperature agglomerated zirconium oxide ( $\text{ZrO}_2$ ) powder (agglomerate temperature  $<1350^{\circ}\text{C}$ ), high-purity aluminum nitride (AlN) powder (purity  $>99\%$ , average grain size  $<1\mu\text{m}$ ), rutile-type titanium dioxide ( $\text{TiO}_2$ ) powder (purity  $>98.5\%$ ), white charcoal (grain size  $<100\text{nm}$ ) and barium titanate (purity  $>99\%$ , grain size  $<1\mu\text{m}$ )
  15. Development and manufacture of high-quality artificial crystal and crystal film products: high-quality synthetic crystals (piezoelectric crystals and UV-transparent crystals), super-hard crystals (cubic boron nitride crystals), heat-resistant and high insulation synthetic crystals (synthetic mica), new electro-optical crystals, high-power laser crystals and large-scale scintillation crystals, diamond film tools, artificial diamond saw blades with a thickness of  $0.3\text{ mm}$  or below
  16. Fine-processing of non-metal ores (super-fine grinding, super-purification, refining, and modification)
  17. Manufacture of super-high electric capacity graphite electrodes
  18. Manufacture of pearlescent mica (grain size between  $3\text{-}150\mu\text{m}$ )
  19. Manufacture of fabrics woven in multidimensional fabric that imitates appearances
  20. Non-hazardous treatment of solid waste using new types of dry cement kilns
  21. Reuse and recycling of construction waste
  22. Comprehensive use of industrial gypsum byproducts
  23. Technological development and application of non-metallic mine tailings, and ecological restoration of mines

*(15) Nonferrous metal smelting and rolling processing*

1. Manufacture of monocrystalline silicon and polished disks of 200 mm and above in diameter
2. Manufacture of new, high-tech non-ferrous materials: compound semiconductor materials (gallium arsenide, gallium phosphide, cobalt phosphide, and gallium nitride); high-temperature superconductor materials; memory alloy materials (nickel titanium, copper-, and iron-based memory alloy materials); super-fine (nanometer) calcium carbide and super-fine (nanometer) crystal hard alloys; super hard compound materials; precious metal-based compound materials, aluminum foil for radiators; aluminum foil for high- and medium- pressure cathode capacitor; special large-scale aluminum alloy materials; sophisticated aluminum alloy molds and casts; suspension cables for electric railway; super-thin copper strips; copper alloy materials for erosion resistant heat exchangers; high-performance copper-nickel, copper-iron alloy strips, beryllium-copper strips, wire, pipe, and bar processing materials; heat- and wear-resistant tungsten filaments; magnesium alloy casts; lead-free welding material, magnesium alloy and other applied materials; aluminum foam; titanium alloy strips and welding connecting tubes; zirconium sponge for nuclear power; and tungsten and molybdenum deep-processed products

*(16) Metal products*

1. Manufacture and research and development of lightweight, eco-friendly new materials for aviation, aerospace, auto, and motorcycles (including specialized aluminum boards, aluminum and magnesium alloy materials, aluminum alloy frames for motorcycles)
2. Development and manufacture of hardware and equipment for construction and water-heating
3. Production and processing (including processing inner and outer surface coatings) of metal packaging for all types of food, oil, fruits and vegetables, beverages, and daily household chemical products (with a thickness of 0.3 mm or less)
4. Manufacture of nickel stainless steel products

*(17) General equipment manufacturing*

1. Manufacture of high-end digital machine tools and critical spare parts: computer numerically controlled (CNC) machine tools with five bearings; digitally controlled boring and milling processing centers; digitally controlled grinders; CNC systems with five bearings and servo installations; digital precision processors with high-speed, extra-hard cutting tools
2. Manufacture of multi-position forging presses of 1,000 tons or more
3. Manufacture of dismantlers, crushers, and post-possessing equipment for junk vehicles
4. Manufacture of FTLs (flexible transfer lines)
5. Manufacture of vertical multi-jointed industrial robots, welding robots, and other welding equipment installation equipment
6. Manufacture of special types of processing machinery: laser cutting and welding equipment sets; precision laser processing equipment; digital, low-speed wire electrical discharger machining (EDM) equipment; and submicron-range disintegrators
7. Manufacture of wheeled and crawler cranes of 400 tons or more (limited to EJVs and CJVs)
8. Design and manufacture of high-pressure piston pumps and motors with working pressure equal to or above 35 MPa, and low-speed, high-torque motors with working pressure equal to or above 35 MPa
9. Manufacture of integrated multichannel valve, and electro-hydraulic proportional servo components with working pressure equal to or above 25 MPa
10. Design and manufacture of pneumatic electromagnetic valves of 0.35 W or less, and high-frequency electric control valves of 200 Hz or more
11. Design and manufacture of hydrostatic drive systems
12. Development and manufacture of non-contact gas seals of 10 MPa or more and dry gas seals of 10 MPa or more (including experimental devices)

13. Development and manufacture of polymer materials for autos (including friction plates, modified phenolic pistons, non-metallic hydraulic master and slave pumps, and others)
14. Manufacture of third- and fourth-generation wheel hub bearings for autos (including functional parts inside the bearings such as circular belts, flanges, and sensors); mid- to high-end digital machine tools and bearing processing centers (processing centers must have a linked capacity of three bearings or more, with repeated positioning precision of 3-4  $\mu\text{m}$ ); high-speed wire materials and rolling bearings that use sheet metal (including single-purpose wire-rod rollers with a rolling speed of 120 m/s or faster, frame and work roll bearings for thin-sheet roller processed sheets with a thickness of 2 mm or more); high-speed railway bearings (200km/h or faster); low-noise bearings with vibration value of Z4 or less (including noise levels of Z4, Z4P, V4, and V4P); and manufacture of various P4- and P2-level bearings, wind turbine bearings (axis bearings, accelerator bearings, generator bearings, etc. with wind power of 2 MW or above); aviation bearings (aviation motor axis bearing, landing gear bearings, transmission bearings, and other control systems)
15. Manufacture of high-density, high-precision, intricately-structured powder metallurgy parts and chains for autos and engineering machinery
16. Manufacture of gear transmissions for wind power, nuclear power, high-speed trains, variable pulp marine gear transmission systems for ships and large, heavy-duty gear boxes
17. Manufacture of high heat-resistant insulation materials (including F and H classes) and insulation forming products
18. Development and manufacture of accumulator capsules, and rubber hydraulic and pneumatic seals
19. Manufacture of high-precision, high-strength (level of 12.9 or above), profiled composite fasteners
20. Manufacture of micro-precision parts transmissions links (clutches)
21. Manufacture of large steel rolling mill connection shafts
22. Remanufacture of machinery and equipment such as machine tools, engineering machinery, railway locomotive equipment, and auto parts

(18) *Specialized equipment manufacturing*

1. Manufacture of trackless mining, loading, and transporting equipment for mines: mechanical-transmission, self-dumping mining trucks of 200 tons or more, mobile crushers, bucket excavators capable of excavating 5,000  $\text{m}^3$ /hour or more, mine loaders of 8  $\text{m}^3$  or more, and electric coal mining machinery of 2,500 kW or more
2. Manufacture of geological exploration and drilling machines: MEME earthquake detector, digital remote seismographs, digital imaging and measuring instruments for oil wells, drilling equipment and tools for horizontal and directional wells, and measurement-while-drilling (MWD) devices
3. Manufacture of equipment for oil exploration and development, drilling, and transportation: floating oil platforms and floating drilling-production systems with a working water depth of 1500 meters or deeper, and complementary sea-floor oil extraction and transportation equipment
4. Manufacture of large-caliber rotary drilling rigs with a diameter of 2 meters or more and a depth of 30 meters or more; pipe jacking machines with a diameter of more than 1.2 meters; manufacture of large equipment sets for laying underground pipelines without digging with a pullback force of 300 tons or more; and manufacture of drills for constructing underground continuous walls and manufacture of vertical drilling systems (VDS)
5. Design and manufacture of large bulldozers with 520 horsepower or more
6. Design and manufacture of silt-cleaning machinery with capacity of 100  $\text{m}^3$ /hour or more and dredging devices for dredging vessels that are 1,000 tons or more
7. Design and manufacture of special equipment for impervious concrete walls used for flood control and emergency rescue



8. Manufacture of underwater earth/rock construction machinery: underwater bulldozers, loaders, and excavators that can operate at water depths of 9 m or deeper
9. Manufacture of equipment for road and bridge maintenance and automatic detection
10. Manufacture of equipment for road and tunnel monitoring, ventilation, disaster prevention, and rescue systems
11. Design and manufacture of equipment and key components for large-scale railroad construction, railway lines, bridges, tunnel repair, machinery maintenance and inspection, and monitoring
12. Manufacture of asphalt shingle equipment, zinc-plated steel, and other metal rooftop production equipment
13. Manufacture of eco-friendly, onsite waterproof polyurethane insulation systems; polyurethane cementing preparation techniques and equipment for polyurethane sealants; and preparation techniques and production equipment for modified silicone sealants
14. Design and manufacture of high-precision strip rollers (precision thickness of 10 microns)
15. Manufacture of mineral ore separation system for multiple elements, fine grains, and metal ores that are difficult to smelt
16. Manufacture of key equipment within complete ethylene production equipment sets that has an annual capacity of 1 million tons or more: mixed granulators with an annual processing capacity of 400,000 tons or more, spiral centrifuges with a diameter of 1,000 mm or wider, and low-flow lift pumps
17. Manufacture of large-scale coal chemical industrial equipment sets (limited to CJVs and EJVs)
18. Design and manufacture of metal dies (such as copper, aluminum, titanium, or zirconium pipes and rods)
19. Design and manufacture of stamping dies for auto body exterior panels and gauges; large injection molds for auto instrument panels and bumpers; and clamp and inspection tools for autos and motorcycles
20. Design and manufacture of special production equipment such as car batteries
21. Design and manufacture of precision stamping dies with a precision of 0.02 mm or higher, precision cavity molds with a precision of 0.05 mm or higher
22. Design and manufacture of nonmetal dies
23. Manufacture of beer canning and packaging equipment with a capacity of 60,000 bottles/hour; lukewarm and hot beverage canning and packaging equipment with a capacity of 50,000 bottles/hour; and sterile canning and packaging equipment with a capacity of 36,000 bottles/hour
24. Manufacture of production technology and key equipment for amino acids, enzyme preparation, and food additives
25. Manufacture of sets of and key parts for feed-processing equipment with a processing capacity of 10 tons/hour or more
26. Manufacture of light corrugated cardboard and packaging where the thickness of an edge is 0.75 mm or thinner
27. Manufacture of multi-color, sheet-fed offset lithographic printing presses (width  $\geq$  750 mm, printing speed:  $\geq$  16,000 sheets/hour of multi-color, single side;  $\geq$  13, 000 sheets/hour of multi-color double sides)
28. Manufacture of single-sheet, single-track web lithographic printing presses with a printing speed of 75,000 sheets/hour or more (paper size 787 mm x 880 mm), double-sheet, single-track web lithographic printing presses with a printing speed of 170,000 sheets/hour or more (paper size 787 mm x 880 mm), and commercial web lithographic printing presses with a printing speed of 50,000 sheets/hour or more (paper size 787 mm x 880 mm)
29. Manufacture of multi-color, wide flexographic printing presses (printing width  $\geq$  1300mm, printing speed  $\geq$  350m/s), inkjet digital printing machines (for publications: printing speed  $\geq$  150m/min, definition  $\geq$  600dpi; for packaging: printing speed  $\geq$  30m/min, definition  $\geq$  1000dpi; for variable data: printing speed  $\geq$  100m/min or more, definition  $\geq$  300dpi)

30. Manufacture of systems for presetting computer ink, remote control of ink colors, speed tracking of liquid ink, and automated monitoring and tracking of print quality, shaftless conveyor technology, high-speed automated paper splicers with a speed of 75,000 sheets/hour, paper feeders and high-speed folding machines that supply paper and automatically control and remotely adjust the process, automated overprinting systems, cooling devices, silicon-added systems, and polarization-adjustment devices
31. Manufacture of automatic coating electronic guns
32. Manufacture of deep-processing technology and related equipment for flat-plate glass
33. Manufacture of complete sets of new paper (including pulp) machinery
34. Manufacture of leather-finishing equipment based on new technology
35. Development and manufacture of new equipment for processing and storage of agricultural goods: equipment for preserving freshness and for sorting, packing, and processing grains, vegetable oils, vegetables, dried and fresh fruits, meat and aquatic products, and other foods; produce-quality inspection and monitoring equipment; inspection and monitoring equipment for agricultural products; rheometers; farinographs; extra-fine powder mullers, high-efficiency dehydration equipment; efficient fruit juice concentration equipment (efficiency level of 5 or higher); equipment for disinfection of powder food; bacteria-free solid and semi-solid food packaging equipment, and disc centrifuges
36. Manufacture of agricultural equipment: agricultural facilities and equipment (automated greenhouse irrigation equipment, automated nutritional fluid allocation and fertilizer application equipment, high-efficiency vegetable cultivation equipment, and soil nutrient analysis equipment); tractors with engine power of 120 kW or more and complementary farm tools; fuel-efficient, low-noise, low-emission diesel engines; sprayers that can recover unused fog particles complementary to large-scale tractors; high-performance rice transplanters; cotton harvesters and pickers; automated corn harvesters (hydraulic or mechanical) that can adapt to varying row widths; rapeseed harvesters, sugar cane harvesters, and beet harvesters
37. Manufacture of forest equipment based on new technology
38. Manufacture of equipment for collection, bundling, and comprehensive utilization of straw
39. Manufacture of equipment for large-scale resource utilization of farm waste and animal- and bird-breeding waste
40. Manufacture of technical equipment to conserve fertilizer, pesticides, and water
41. Manufacture of cleaning equipment for electromechanical wells and pharmaceutical production equipment
42. Manufacture of electronic endoscopes
43. Manufacture of retinal cameras
44. Manufacture of key elements of medical imaging equipment (high-field superconducting magnetic resonance imaging equipment, X-ray computed tomography imaging equipment, and digital color ultrasound diagnostic equipment)
45. Manufacture of supersonic energy converters (3D) for medical applications
46. Manufacture of boron neutron capture therapy (BNCT) equipment
47. Manufacture of image-guided, intensity-modulated radiation therapy systems
48. Manufacture of hemodialysis and blood-filtering machines
49. Manufacture of automatic enzyme immunoassay equipment (with functioning include sample addition, enzyme labeling, washing templates, hatching, and data management)
50. Manufacture of new technology and equipment that control medicine quality
51. New technology for analysis of effective ingredients in natural medicines, new techniques for extraction, and development and manufacture of new equipment for these purposes
52. Manufacture of multi-layer water-cooled film blow molding equipment with non-PVC medical intravenous infusion bags
53. Development and manufacture of new textile machinery, key parts, and instruments for textile inspection and experimentation

54. Manufacture of computerized jacquard equipment for making fake fur
55. Manufacture of specialized equipment for the production of solar-powered batteries
56. Manufacture of air-pollution prevention and control equipment: high-temperature- and corrosion-resistant filtering material, low-NO<sub>x</sub> combustion equipment; catalysts for denitrification of smoke and complete set of denitrification equipment; purification equipment for polluted organic gases, purification equipment for gas expelled from diesel vehicles; treatment devices for exhaust gas containing heavy metals
57. Manufacture of water-pollution prevention and control equipment: horizontal screw centrifugal dehydrators, membrane and membrane materials, ozonizers with more than 50 kg/hour, chlorine dioxide generators with more than 10 kg/hour, ultraviolet disinfection devices, small domestic sewage treatment devices in rural areas, treatment devices for waste water containing heavy metals
58. Manufacture of equipment used to treat solid waste: equipment for wastewater treatment plant sludge disposal and resource utilization; trash incineration equipment for daily processing capacity of more than 500 tons; landfill leachate treatment technology and equipment; impermeable landfill geomembrane; construction, waste disposal, and resource utilization equipment; hazardous waste treatment plants; landfill methane power generation equipment; waste iron and steel processing equipment; contaminated soil restoration equipment
59. Development and manufacture of equipment for comprehensive utilization of red clay in the aluminum industry
60. Manufacture of equipment for comprehensive use of mine tailings
61. Manufacture of equipment for management and reuse of waste plastics, electronic equipment, rubber, and for recycling batteries
62. Manufacture of equipment for textile waste recycling and processing
63. Manufacture of equipment for remanufacture of waste machinery and power-generating products
64. Manufacture of equipment for comprehensive use of waste tires
65. Manufacture of technology and equipment for protection of the aquatic ecological environment
66. Manufacture of mobile water purification equipment
67. Innovative water treatment, reusable equipment, and water quality monitoring instruments
68. Leak detection apparatuses and equipment for industrial water supply network and equipment (apparatus)
69. Development and manufacture of seawater desalination and circulation-cooling technology and equipment sets with production capacity of 100,000 m<sup>3</sup> or more
70. Manufacture of special equipment for weather observation and analysis
71. Development and manufacture of equipment for seismological stations, networks, and mobile systems with seismological observation technology
72. Manufacture of machines for construction of radial tires with three or more drums
73. Manufacture of machines for experiments with rolling resistance and of tire noise laboratories
74. Manufacture of new technical equipment for heating measurement and temperature control
75. Manufacture of equipment for production, storage, and transportation of hydrogen energy and associated testing systems
76. Manufacture of new heavy (residual) fuel oil spray nozzles, high-efficiency steam dredging valves (with gas leakage at or below 0.5%) and high-temperature (at or above 1,000°C) ceramic heat converters
77. Manufacture of oil spill recovery equipment
78. Manufacture of equipment for low concentration of coal mine gases with lack of wind use

(19) *Transportation vehicle and equipment manufacturing*

1. Manufacture of auto engines and establishment of engine research and development (R&D) institutions: gasoline engines with power no less than 70 kW/liter (kW/L); diesel engines with power no less than 50 kW/L and engine displacement of less than 3 liters; diesel engines with

power no less than 40 kW/L and engine displacement of more than 3 liters; new-energy engines driven by fuel cells, mixed-fuel, and other new energies

2. Manufacture of critical auto parts and R&D in key technologies: double clutch transmission (DCT), electronically-controlled automated mechanical transmissions (AMT), gasoline engine turbochargers viscous coupling units (for four-wheel drive), automatic transmission actuators (solenoid valve), hydraulic retarder, eddy current retarders, gas generators for airbag safety systems, common-rail fuel injection technology (maximum injection pressure greater than 2,000 Pa), variable geometry turbocharger (VGT) technology, variable nozzle turbocharger (VNT) technology, engine emission control devices complying with China Phase V Pollutant Emission Standards, intelligent torque management (ITM) systems and coupling components, steering-by-wire systems, diesel particulate filters (DPF), special axles for low-floor buses, energy-absorbing steering systems, inverter air conditioning systems for large- and medium-sized passenger cars, special rubber auto accessories, and key parts of the above-mentioned components.
3. Manufacture and R&D of electronic equipment for autos: electronic control systems for engines and chassis and key parts; vehicle electronic technology (car information systems [CIS] and navigation systems); vehicle electronic bus and networking technology (limited to EJV); input (sensors and sampling systems) and output (actuators) components for electronic control systems; electronic controllers for electric-powered steering devices (limited to EJV); integrated electronic circuit systems (limited to CJV and EJV); electronically controlled air springs; electronically controlled suspension systems, electronic valve system fixtures, electronic instrument clusters, ABS/TCS/ESP systems, circuit braking systems (BBW), transmission electronic control units (TCU), tire pressure monitoring systems (TPMS), on-board diagnostics (OBD), engine anti-theft systems, automatic collision-avoidance systems, testing and maintenance systems for automobiles and motorcycles
4. Manufacture of key components of new-energy autos: energy-type batteries (energy density  $\geq$  110 Wh/kg, life cycle  $\geq$  2,000 times, foreign investment cannot exceed 50%), battery cathode material (capacity  $\geq$  150 mAh/g, life cycle of 2,000 times no less than 80% of the initial discharge capacity), battery separator (thickness 15-40  $\mu$ m, porosity 40 -60%); battery management systems, electrical motor management systems, electric controls for electric vehicles; electric vehicle drive motors (peak power density  $\geq$  2.5 kW/kg, effective area: 65% efficiency of the work area  $\geq$ 80%), automotive DC/DC (input voltage 100V-400V), high-power electronic devices (IGBT, voltage  $\geq$  600V, current  $\geq$  300A); plug-in hybrid electromechanical coupling drive systems
5. Production of critical spare parts for motorcycles with high-volume engine displacement (displacement of more than 250 ml): motorcycle electronically controlled fuel injection technology (limited to CJV and EJV); engine emission control devices that comply with China Motorcycle Phase III Pollutant Emission Standards
6. Railway transportation equipment (limited to CJV and EJV): R&D, design, and manufacture of vehicles and critical parts (traction drive systems, control systems, brake systems) for high-speed railways, railroad passenger lines, inter-city railways, mainline railways, and urban railway transportation; R&D, design, and manufacture of passenger service facilities and equipment for high-speed railways, railroad passenger lines, inter-city railways, and urban railways; design and R&D of information systems; R&D, design, and manufacture of rail and bridges in high-speed railways, railroad passenger lines and inter-city railways; R&D, design, and manufacture of rapid transit communications and signaling systems; manufacture of equipment and devices on electrified railways; R&D of railway noise- and vibration-control technology; manufacture of equipment for railroad passenger car waste discharge; and manufacture of equipment for monitoring railway transportation safety
7. Design, manufacture, and maintenance of civil aviation airplanes: airplanes for main and branch lines (Chinese side must hold a controlling interest), planes for general use (limited to CJV and EJV)
8. Manufacture and maintenance of spare parts for civil aviation airplanes

9. Design and manufacture of civil aviation helicopters: more than 3 tons (Chinese side must hold a controlling interest), less than 3 tons (limited to CJVs and EJVs)
10. Manufacture of spare parts for civil aviation helicopters
11. Manufacture of aircraft for ground or water surface effects (Chinese side must hold a controlling interest)
12. Design and manufacture of unmanned aircraft and aerostats (Chinese side must hold a controlling interest)
13. Design, manufacture, and maintenance of airplane engines and critical parts and auxiliary power systems (limited to CJVs and EJVs)
14. Design and manufacture of civil aviation carrier-borne equipment (limited to CJVs and EJVs)
15. Manufacture of aviation ground facilities: civil airport facilities, civil airport operation support facilities, ground facilities for flight experimentation, flight simulation and training equipment, equipment for aeronautic trials and measurement, aviation experimentation ground facilities, comprehensive testing equipment for aircraft equipment, special equipment for aircraft manufacturing, special equipment for trial runs for aeronautic materials, ground receiving and applied equipment for civil aviation instruments, on-ground testing equipment for on-board rockets, mechanical and environmental testing equipment for on-board rockets
16. Manufacture of optical, mechanical, and electric products for spacecraft; temperature control products for spacecraft; satellite payload testing equipment; and structural and mechanism-based products for spacecraft
17. Manufacture of light gas-turbine engines
18. Design of cruise ship and deep ocean (deeper than 3,000 meters) engineering devices (limited to EJVs and CJVs)
19. Repair and manufacture of oceanic engineering equipment (including modules) (Chinese side must hold a controlling interest)
20. Design of low- and medium-speed diesel engines and related parts for ships (limited to CJVs and EJVs)
21. Manufacture of low- and medium-speed diesel engines and related parts for ships (Chinese side must hold the largest controlling interest)
22. Design and manufacture of machinery for ship cabins and decks (Chinese side must hold the largest relative controlling interest)
23. Design and manufacture of ship communication and navigation equipment: ship communications system equipment, ship electronic navigation equipment, ship radar, gyrocompass-driven autopilot functions, and ship public broadcasting system for internal use
24. Manufacture and design of yachts (limited to CJVs and EJVs)

(20) *Power generating machinery and equipment manufacturing*

1. Manufacture of key auxiliary devices for supercritical thermal power plants exceeding 1 million kW (limited to EJVs or CJVs): safety valves and control valves
2. Manufacture of sintering denitration technology equipment for coal-fired power plants and steel industry
3. Design and manufacture of sealing elements for thermal power equipment
4. Manufacture of large-scale casting and forging parts for equipment used in coal-fired power plants and hydropower stations
5. Manufacture of key auxiliary devices for hydropower plants
6. Manufacture of power transmission and transformer equipment (limited to EJVs and CJVs): manufacture of non-crystal alloy transformers, high-voltage (500 kV and above) switch-oriented operating mechanisms, arc-extinguishing devices, large-pot insulators (1,000 kV, 50 kA and above); transformer-oriented outlet devices (500 kV and above), pipe casings (AC 500, 750, 1,000 kV, DC all specifications), voltage switches (AC 500, 750, 1,000 kV -load, no-load voltage switch), electric reactors for direct current transmission,  $\pm$  800 kV DC transmission with

- converter valves (water-cooling equipment, DC field equipment); non-lead, non-cadmium solder and electronic appliance contact materials in compliance with EU RoHS standards
7. Manufacture of complete sets of equipment and key equipment for new-energy power generation: photovoltaic power generation, geothermal power generation, tidal power generation, wave power generation, refuse power generation, methane gas power generation, and wind power generation equipment at 2.5 MW or higher
  8. Manufacture of large pump storage units at 350 MW and higher rated power (limited to EJVs and CJVs): system integration design and simulation of auxiliary equipment such as pump-turbines and speed-adjustment devices, large variable speed reversible pump-turbine units, power generation motor excitation devices, and other starter devices
  9. Manufacture of Stirling power generation units
  10. Development and manufacture of vertical and horizontal electric motors and associated drive systems
  11. Manufacture of high-tech green batteries: power nickel-hydrogen batteries, nickel-zinc batteries, silver-zinc batteries, lithium ion batteries, solar cells, fuel cells, etc. (except for batteries for new energy vehicles)
  12. Manufacture of refrigeration and air conditioning compressors with direct current motor speed control technology, refrigeration and air conditioning compressors with natural CO<sub>2</sub> refrigerant, and refrigeration and air conditioning equipment with application of renewable energy sources (air, water, and ground sources)
  13. Manufacture of solar-powered air conditioners, solar-powered heating systems, and solar-powered drying devices
  14. Manufacture of systems for thermal decomposition of dried biomass and biomass gasification devices
  15. Manufacture of alternating-current frequency-modulation traction equipment
- (21) *Communication equipment, computer, and other electronics manufacturing industry*
1. Manufacture of HDVs (high-definition video), digital record players
  2. Manufacture of TFT-LCD, PDP, OLED flat panel displays and materials used in flat panel displays (excluding TFT-LCD glass substrate sixth generation and below)
  3. Manufacture of optical engines, light sources, projection screens, high-definition projection tubes, micro-projector equipment modules, and other key parts used for big-screen color projection display
  4. Manufacture of digital audio and video frequency coding and decoding equipment, digital broadcasting studio equipment, digital cable television system equipment, digital audio frequency broadcasting equipment, digital TV uplink and downlink switchers, SFN equipment for digital TV broadcasting, uplink station facilities for satellite-based digital TV broadcasting, and front-end equipment for SMATV
  5. Design of integrated circuits; manufacture of large integrated circuits with 0.18 micron or smaller process technology and simulated/numerical module integrated circuits with 0.8 micron or smaller process technology; manufacture of MEMS and compound semiconductor integrated circuits, advanced sealing and testing of BGA, PGA, CSP, and MCM
  6. Manufacture of large- and medium-sized computers, super computers (1 teraflop per second and faster), portable micro computers, top-grade servers (1 petaflop per second and above), large-scale simulation systems, large industrial control systems and control devices
  7. Manufacture of computer-based digital signal processing systems and integrated circuit boards
  8. Manufacture of systems for graphic and image identification and processing
  9. Development and manufacture of high-capacity optical and magnetic disc drives and associated parts
  10. Manufacture of storage systems (high-speed and at a volume of 100TB or above) and intelligent storage equipment

11. Manufacture of computer-aided design (three-dimensional CAD), computer-aided testing (CAT), computer-aided manufacturing (CAM), and computer-aided engineering systems, and related computer applications
  12. Development and manufacture of software products
  13. Development and manufacture of materials for specialized electronics use (except for development and manufacturing of prefabricated rods for fiber optics)
  14. Manufacture of special electronic equipment, testing equipment, and tools and dies
  15. Production of new types of electronic parts: chip components, sensitive components, and sensors; frequency control and selecting components; hybrid integrated circuits; electric-powered electronic parts; photoelectric components; new types of electro-mechanical components; high polymer solid capacitors, super-capacitors and integrated passive components; high-density build-up boards, multilayer flexible boards, strong flexible printed circuit boards, and packaging carrier boards
  16. Manufacture of touch control systems (touch screens, touch components, etc.)
  17. Manufacture of high-illumination light emitting diodes (LED) (illumination efficiency: 1,001 m/W or above), LED panels (blue, illumination efficiency: 1,001 m/W or above), white illuminating tubes (illumination efficiency: 1,001 m/W or above and power above 200 mW)
  18. Development and manufacture of parts for high-density digital optical compact disk drives
  19. Copying of read-only CDs and manufacture of recordable CDs (CD-RW)
  20. Design and manufacture of civil satellites (Chinese side must hold a controlling interest)
  21. Manufacture of satellite payloads (Chinese side must hold a controlling interest)
  22. Manufacture of parts for civil satellites
  23. Manufacture of equipment for satellite communications systems
  24. Manufacture of receiving equipment for satellite navigation and key parts
  25. Manufacture of optical communications measuring instruments, and of optical transceivers with a speed of 10 GB/s or more
  26. Manufacture of ultra wide band (UWB) communications equipment
  27. Manufacture of equipment for wireless local area networks (including ones compatible with WAPI) and wireless wide area networks
  28. Manufacture of time-division multiplexing (TDM) equipment at a rate of 40 Gbps or more, dense wavelength-division multiplexing (DWDM) equipment, passive broadband network equipment (including EPON, GPON, WDM-PON, etc.), next-generation digital subscriber line (DSL) microchips and equipment, optical cross-connect (OXC) equipment, automatically switched optical networks (ASON), fiber optic transmitters of 40 G/sSDH or more
  29. Development and manufacture of next-generation Internet system equipment, terminal equipment, testing equipment, software, and chips based on IPv6
  30. Manufacture of equipment for third-generation and later mobile communication system mobile phones, base stations, core network equipment, and network testing equipment
  31. Manufacture and development of high-end routers and network switches more than 1 gigabyte (GB)
  32. Manufacture of air-traffic control equipment (limited to EJVs and CJVs)
- (22) *Manufacturing of devices, instruments, and machines for cultural and office use*
1. Manufacture of automatic industrial processing systems and devices: fieldbus control systems, large-scale programmable logic controller (PLC), two-phase flow meters, solid flow meters, new sensors, and field surveying instruments
  2. Development and manufacture of large precision instruments: electron microscopes, laser scanning microscopes, scanning tunneling microscope, electric field probes, metallographic microscopes, photoelectric readout spectrometers, raman spectrometers, mass spectrometers, chromatography-mass spectrometers, nuclear magnetic resonance spectrometers, energy spectrum instruments, X-ray fluorescent spectrometers, diffractometers, industrial CT, 450 kV

- industrial X-ray damage detectors, large dynamic balancing machines, online systems for monitoring and measuring mechanical quantity, coordinate measuring machines (CMM), laser comparators, electrical prospecting instrument, airborne (above 500 m) electrical and gamma energy spectrum measuring instruments, borehole gravimeters and three-component magnetometers, high-accuracy microgravity and aeronautic gravity gradient measuring instruments, optical grid rulers, and encoders
3. Manufacture of high-accuracy digital voltmeters and high-accuracy digital ammeters (with a display range of more than 7.5 digits)
  4. Manufacture of reactive power automatic compensation devices
  5. Manufacture of production-safety equipment and devices
  6. Manufacture of VXI bus automatic testing systems (in line with IEEE1155 international standards)
  7. Development and manufacture of underground coal mine monitoring and disaster prediction systems and of integrated management systems for examining coal mine safety
  8. Manufacture of engineering measurement and geophysical observation equipment: digital triangulation systems, computer-numerically controlled (CNC) prototype systems for 3D terrain modeling (area > 1,000 mm × 1,000 mm, level error < 1 mm, height error < 0.5 mm), ultra-broadband seismometers ( $\Phi < 5$  cm, bandwidth 0.01-50 Hz, equivalent earthquake noise speed < 10-9 m/s), seismic data collection and processing systems, integrated systems for observing borehole earthquakes and seismic precursors, precision vibroseis systems, engineering acceleration measurement systems, high-precision GPS receivers (precision 1 mm+1 ppm), interferometric synthetic aperture radar (INSAR) image receiving and processing systems, absolute gravimeters (accuracy < 1 micro-gamma), satellite gravimeters, coherent and dual-polarization Doppler weather radar systems, visibility meters, meteorological sensors (temperature, air pressure, humidity, wind, precipitation, clouds, visibility, radiation, soil freezing, and snow depth), lightning protection systems, multi-level dust collectors, 3D ultrasound wind speed instruments, high-precision intelligent total station instruments, 3D laser scanners, high-performance diamond drilling heads used for drilling and exploration, laser range-finders without linked targets, wind profilers (with radio acoustic sounding systems [RASS]), GPS electronic detection instrument systems, CO<sub>2</sub>/H<sub>2</sub>O fluctuation observation systems, border Doppler laser radar, particle size spectrometers (3nm-20 μm), high-performance data collectors, and underwater gliders
  9. Manufacture of equipment for environment monitoring: automatic SO<sub>2</sub> sample collectors and analyzers, automatic NO<sub>x</sub> and NO<sub>2</sub> sample collectors and analyzers, automatic O<sub>3</sub> monitors, automatic CO monitors, smoke and Pm2.5 particulate sampling tools and cutters, portable instruments for measuring toxic and hazardous gas, automatic analyzers for organic air pollutants, automatic online chemical oxygen demand (COD) monitors, automatic online biochemical oxygen demand (BOD) monitors, automatic online turbidity monitors, automatic online dissolved oxygen (DO) monitors, automatic online total organic carbon (TOC) monitors, automatic online ammonia and nitrogen monitors, radiation volume monitors and analyzers, heavy metals online monitoring equipment, on-line early-warning water quality monitoring equipment for biological toxicity
  10. Manufacture of water-level data collection, processing and analysis, and flood-prevention warning devices and equipment
  11. Manufacture of ocean exploration monitoring devices and equipment: mid-depth and lower seawater video recorders and cameras, multi-beam detectors, sonar for shallow and intermediate depths, saltwater navigation sonar, fluxgate compasses, hydraulic winches, underwater sealed electronic connectors, energy-recycling equipment for reverse osmosis desalination (efficiency > 90%), buoys for monitoring the marine ecological environment, buoys for profile detection, expendable conductivity-temperature-depth (XCTD) devices, field instruments for measuring water quality, intelligent chemical sensors for monitoring of marine water quality



(consecutive operation of 3-6 months), electromagnetic current meters, acoustic Doppler current profilers (ADCP) (self-contained, read-display, and ship-based), CTD profilers, acoustic response releasers, deep-sea tide-measuring systems (based on the seafloor)

12. Manufacture of digital cameras with resolution above 10 million pixels
13. Manufacture of office machinery: integrated multi-function office equipment (copy, print, fax, and scan), color printing equipment, high-resolution color printers and printer heads at a precision of no less than 2,400 dpi, and light-sensitive drums
14. Manufacture of movie machinery: 2K and 4K digital cinema projectors, digital movie cameras, digital video production, and editing equipment

(23) Crafts and other manufacturing industries

1. Manufacture of equipment for, and development of, products and technologies for clean coal (gasification, liquefaction, coal-water slurry, and industrial coal)
2. Coal washing and the comprehensive utilization of coal ash (including desulfurized gypsum) and coal refuse
3. Manufacture of biodegradable materials
4. Recycling of waste electrical and electronic products, autos, electrical equipment, rubber, metal, and batteries

#### **IV. Production and Supply of Electric Power, Gas, and Water**

1. Construction and operation of power stations utilizing clean-coal technology, including integrated coal gasification combined cycle (IGCC) technology, circulating fluidized bed technology of 300,000 kW and above, or pressurized fluidized bed combustion (PFBC) technology of 100,000 kW or more
2. Construction and operation of backpressure thermal-electrical co-generation stations
3. Construction and operation of hydropower stations used primarily for power generation
4. Construction and operation of nuclear power stations (Chinese side must hold a controlling interest)
5. Construction and operation of new-energy power stations (including solar, wind, magnetic, geothermal, tidal, wave, and biomass energy, etc.)
6. Utilization of seawater (direct use of seawater, desalination)
7. Construction and operation of water supply plants
8. Construction and operation of water-recycling factories
9. Construction and operation of vehicle battery charging stations and battery replacement stations

#### **V. Transportation, Shipping, Storage, and Postal Industries**

1. Construction and operation of main line railroad networks (Chinese side must hold a controlling interest)
2. Construction and operation of branch railway lines, local railways and bridges, tunnels, ferry facilities, and station yard facilities (limited to EJVs and CJVs)
3. Comprehensive maintenance of basic infrastructure for high-speed railways, dedicated railway passenger lines, and intercity railways
4. Construction and operation of highways, independent bridges, and tunnels
5. Road freight transportation companies
6. Construction and operation of public dock facilities at ports
7. Construction and operation of civil airports (Chinese side must hold the largest relative controlling interest)
8. Air carrier shipping companies (Chinese side must hold a controlling interest)
9. General purpose airline companies serving the agriculture, forestry, and fisheries industries (limited to EJVs and CJVs)

10. Periodic and aperiodic international marine transportation services (Chinese side must hold a controlling interest)
11. International multi-style container transportation cooperative business
12. Construction and operation of oil (gas) pipelines, oil (gas) depots
13. Construction and operation of coal pipeline transport facilities
14. Construction and operation of automatic storage & retrieval system (AS/RS), storage facilities relating to transportation

#### **VI. Wholesale and Retail**

1. Modern logistics and related technical services such as the joint distribution of general goods and low-temperature distribution of fresh products
2. Rural distribution networks
3. Construction and operation of pallet pooling systems

#### **VII. Leasing and Business Services**

1. Accounting and auditing (limited to CJVs and partnerships)
2. Information consulting services in international economics, technology and science, environmental protection, and logistics
3. Information technology and services outsourcing involving system application management and maintenance, information technology support management, bank back-office services, financial settlement, human resources services, software development, offshore call centers and data processing, or other information technology and business processing services (BPO)
4. Venture capital enterprises
5. Intellectual property rights (IPR) services
6. Household services

#### **VIII. Scientific Research, Comprehensive Technological Services, and Geological Prospecting**

1. Biological engineering and biomedical engineering technology, biomass energy development technology
2. Isotopic, irradiation and laser technologies
3. Oceanic development and oceanic energy (development) technology, technology for comprehensive use of ocean chemical resources, related product development and refined processing technology, and ocean medicine and bio-chemical product development technology
4. Ocean monitoring technology (ocean tides, weather, and environment monitoring), sea floor detection and ocean resources exploration and evaluation technology
5. Comprehensive use of post-desalinization concentrated seawater for salt manufacturing; extraction of potassium, bromine, magnesium, and lithium as well as their deep processing technologies and other seawater chemical resource high value-added utilization technologies
6. Development of marine oil pollution clean-up and ecological restoration technologies and related products, water eutrophication prevention and control technology, technology to prevent and control sudden and damaging overgrowth of marine life, and technologies for ecological restoration of coastal environments
7. Development of energy conservation technology and related services
8. Recycling and related applicable technologies, development and application of (enterprise) manufacturing emissions recycling technology
9. Environmental pollution treatment and monitoring technology
10. Energy reduction and waste management (gas, water and industrial residue) technology for synthetic fiber production, printing, and dyeing processes
11. Technology for the prevention and management of desertification
12. Comprehensive management technology for grassland-livestock balance
13. Civilian satellite application technology

14. Research and development centers
15. Centers for new- and high-technology development, new product development, and start-up incubators

#### **IX. Water Conservancy, the Environment, and Public Infrastructure Management**

1. Construction and operation of key comprehensive water-conservancy hubs (Chinese side must hold a controlling interest)
2. Construction and operation of limited-access urban roads
3. Construction and operation of metro, light rail, and other urban rapid transit systems (Chinese side must hold a controlling interest)
4. Construction and operation of sewage treatment plants, garbage treatment plants, hazardous waste disposal and treatment plants (incineration plants, landfills), and environmental pollution control facilities

#### **XI. Education**

1. Institutions of higher education (limited to EJVs and CJVs)
2. Vocational skills training

#### **X. Healthcare, Social Security, and Social Welfare Services**

1. Service centers for the elderly, the disabled, and children

#### **XIII. Culture, Sports, and Entertainment Industries**

1. Operation of performance venues (Chinese side must hold a controlling interest)
2. Operation of sports venues and sports training and intermediary services for fitness, competitions, and performances

## **Restricted Foreign Investment Industries**

### **I. Agriculture, Forestry, Animal Husbandry, Fishery, and Related Industries**

1. Selection and breeding of new types of agricultural goods, and production of seeds (Chinese side must hold a controlling interest)
2. Processing of precious wood (limited to CJVs and EJVs)
3. Processing of cotton (including seed cotton)

### **II. Mining**

1. Surveying and mining of special and rare coal (Chinese side must hold a controlling interest)
2. Surveying and mining of barite (limited to CJVs and EJVs)
3. Surveying and mining of precious metals (gold, silver, and platinum)
4. Surveying and mining of critical nonmetal ores such as diamonds, high alumina refractory cement, wollastonite, and graphite
5. Extraction and mineral separation of phosphate, lithium, and sulfur iron ores, and refining of brine resources from salt lakes
6. Mining of boron-magnesium-iron ore
7. Mining of lapis lazuli
8. Mining of manganese (polymetallic) nodules and sea sand (Chinese side must hold a controlling interest)

### **III. Manufacturing**

(1) *Food processing*

1. Processing of edible oils from soybeans, rapeseeds, peanuts, cottonseeds, tea seeds, sunflower seeds, and palm oil seeds (Chinese side must hold a controlling interest); processing of rice, flour, and deep processing of corn
2. Manufacture of biofuels (ethanol and biodiesel) (Chinese side must hold a controlling interest)

(2) *Beverage manufacturing*

1. Manufacture of yellow rice wine and famous and high-quality distilled spirits (Chinese side must hold a controlling interest)

(3) *Tobacco products manufacturing*

1. Processing and production of tobacco threshing and re-drying

(4) *Printing and copying*

1. Printing of published materials (Chinese side must hold a controlling interest)

(5) *Petroleum processing, coking, and nuclear fuel processing industries*

1. Atmospheric and vacuum distillation oil refining with annual production under 10 million tons per year, catalytic cracking with annual production under 1.5 million tons per year, continuous catalytic reforming (including aromatics extraction) with annual production under 1 million tons per year, hydrocracking production with annual production under 1.5 million tons per year.

(6) *Chemical raw materials and chemicals manufacturing*

1. Manufacture of soda ash, caustic soda and sulfuric acid, nitric acid, potash with limited scale or manufactured by outdated technology
2. Manufacture of light-sensitive materials
3. Manufacture of biphenylamine
4. Manufacture of medical goods that can be used to manufacture drugs (ephedrine, 3, 4-methylenedioxyphenyl-2-propanone, benzene acetic acid, 1-phenyl-2-acetone, heliotropin, yellow camphor, other yellow camphors, acetic acid anhydride)
5. Manufacture of hydrofluoric acid and other low-end hydrochlorofluorocarbon (HCFC) and chlorofluorocarbon (CFC) compounds
6. Manufacture of butadiene rubber (does not include high cis-butadiene rubber), emulsion polymerized styrene-butadiene rubber, and thermoplastic styrene-butadiene rubber
7. Manufacture of polyvinyl chloride (PVC) produced from acetylene, and ethylene and post processing products under a certain scale
8. Manufacture of paints and dyes with outdated technology, containing harmful materials, and below certain required scale
9. Processing of boron-magnesium-iron ore
10. Manufacture of inorganic salts that uses too many natural resources, pollutes the environment, and uses outdated technology

(7) *Medical and pharmaceutical products manufacturing*

1. Manufacture of chloramphenicol, penicillin G, lincomycin, gentamicin, dihydrostreptomycin, amikacin, tetracycline hydrochloride, oxytetracycline, medemycin, kitasamycin, norfloxacinum, ciprofloxacin, and ofloxacin
2. Manufacture of Analgin, acetaminophen, vitamin B1, B2, C, E, multi-vitamin tablets, and oral calcium agents
3. Manufacture of vaccines included in the national plan
4. Manufacture of anesthetics and Type I psychoactive drugs (Chinese side must hold a controlling interest)

5. Manufacture of blood-related products

(8) *Chemical fiber manufacturing*

1. Manufacture of chemical fibers through a conventional chipper
2. Manufacture of viscose fibers

(9) *Nonferrous metal smelting and processing manufacturing*

1. Smelting of tungsten, molybdenum, tin (excluding tin compounds), antimony (including antimony trioxide and antimony sulfide), and other rare metals
2. Smelting of electrolytic aluminum, copper, lead, zinc, and other non-ferrous metals
3. Smelting and separation of rare earths (limited to CJVs and EJVs)

(10) *General equipment manufacturing*

1. Manufacture of all types of common bearings (P0) and parts (steel ball and cage ring) and semi-finished models
2. Manufacture of wheeled cranes and crawler cranes less than 400 tons (limited to CJVs and EJVs)

(11) *Special-use equipment manufacturing*

1. Manufacture of common long-thread terylene and short-fiber devices
2. Manufacture of bulldozers with 320 horsepower or less, excavators with hydraulic pressure of 30 tons or less, wheeled loading machines of 6 tons or less, graders with 220 horsepower or less, road rollers, forklifts, power-transmission off-highway automatic dumpers of 135 tons or less, hydraulic mechanical-transmission non-highway automatic dumpers of 60 tons or less, asphalt concrete mixing and paving equipment and high-altitude operating machines, horticulture machines and instruments, and commercial cement concrete mixing machines (pumps, cement mixers, mixing stations, and pump cars)

(12) *Transportation and shipping infrastructure manufacturing*

1. Repair, design, and manufacture of ships (including parts) (Chinese side must hold a controlling interest)

(13) *Electronics and telecommunications appliance manufacturing*

1. Production of satellite television receiving and broadcasting equipment and key parts

**IV. Electricity, Gas, and Water Production and Supplies**

1. Construction and operation of coal-fired, steam-condensing power plants with single-machine capacity below 300,000 kW, or coal-fired, steam-condensing power heating units with single-machine capacity below 100,000 kW (within small-scale power networks)
2. Construction and operation of electricity grids (Chinese side must hold a controlling interest)
3. Construction and operation of gas, heat supply, and water drainage network in cities with a population of more than 0.5 million (Chinese side must hold a controlling interest)

**V. Transportation and Shipping, Warehousing, and Post and Telecommunications**

1. Freight train transportation companies
2. Passenger train transportation companies (Chinese side must hold a controlling interest)
3. Road passenger transportation companies
4. Cross-border automobile transportation companies
5. Water transportation companies (Chinese side must hold a controlling interest)
6. General-use airline companies for photography, prospecting, and industrial purposes (Chinese side must hold a controlling interest)

7. Telecom companies: value-added telecom services (foreign equity stake must not exceed 50%); basic telecommunication services (foreign equity stake must not exceed 49%)

## **VI. Wholesale and Retail Trade**

1. Direct sales, mail-order, online selling
2. Procurement of grain; wholesale, retail, and distribution of grain, cotton, vegetable oil, sugar, tobacco, crude oil, pesticides, agricultural film, and fertilizer (for retail operations of more than 30 chain stores that sell different types and brands from multiple suppliers, the Chinese side must hold a controlling interest)
3. Construction and operation of large-scale wholesale markets of agricultural products
4. Distribution of audio-visual products (except films) (limited to CJVs)
5. Shipping agents (Chinese side must hold a controlling interest); foreign freight forwarders (limited to CJVs and EJVs)
6. Wholesale of refined petroleum as well as construction and management of gas stations (for retail operations of more than 30 chain stores established by the same foreign investor that sell different types and brands from multiple suppliers, the Chinese side must hold a controlling interest)

## **VII. Finance and Insurance**

1. Banks, finance companies, trust companies, and currency brokerages
2. Insurance companies (foreign stake in life insurance companies must not exceed 50%)
3. Securities companies (limited to underwriting A shares and underwriting and transacting B shares, H shares, and government and corporate securities; foreign equity stake must not exceed one-third) and stock investment fund companies (foreign equity stake must not exceed 49%)
4. Insurance brokerages
5. Futures trading companies (Chinese side must hold a controlling interest)

## **VIII. Real Estate**

1. Development of land (limited to EJVs and CJVs)
2. Construction and operation of luxury hotels, high-end office buildings, and international conferences and exhibition centers
3. Real estate secondary market exchanges, intermediaries, and brokerages

## **IX. Leasing and Business Services**

1. Legal consulting
2. Market research (limited to EJVs and CJVs)
3. Credit rating and evaluation services companies

## **X. Scientific Research, Technology Services, and Geological Survey Industries**

1. Surveying and mapping companies (Chinese side must hold a controlling interest)
2. Import-export commodity inspection, appraisal, and authentication companies
3. Photography services (including aerial photography and other stunt photography services, but not aerial photography for surveying and drawing; restricted to EJVs)

## **XI. Education**

1. Basic secondary (high-school) educational institutions (limited to CJVs)

## **XII. Cultural, Sports, and Entertainment Companies**

1. Production of radio and television programs and films (limited to CJVs)
2. Construction and management of movie theaters (Chinese side must hold a controlling interest)
3. Construction and management of theme parks

4. Performance agent companies (Chinese side must hold a controlling interest)
5. Operation of entertainment venues (limited to EJVs and CJVs)

### **XIII. Other industries restricted by the state or by international treaties for which China adheres or has ratified**

## **Prohibited Foreign Investment Industries**

### **I. Agriculture, Forestry, Animal Husbandry, and Fishery**

1. Research and development, cultivation, and growth of China's rare and precious breeds, and production of related reproductive materials (including beneficial genes in the horticultural, animal husbandry, and aquatic products industries)
2. Research and production of genetically modified crop seeds, livestock, and aquatic seeds and seedlings
3. Fishing in Chinese waters

### **II. Mining**

1. Surveying and mining of tungsten, molybdenum, tin, antimony, and fluorite
2. Surveying, mining, and selection of rare-earth minerals
3. Surveying, mining, and selection of radioactive minerals

### **III. Manufacturing**

#### *(1) Beverage production*

1. Processing of traditional Chinese green and special teas (including famous teas and black teas)

#### *(2) Pharmaceuticals*

1. Processing of traditional Chinese medicines listed in the Regulations on Protecting Natural Medicinal Resources and Catalogue of Rare and Endangered Plants in China
2. Preparation techniques for traditional Chinese medicine, such as steaming, frying, brewing, forging, and moxibustion, and production of Chinese medicine subject to trade secrets

#### *(3) Smelting and processing of nonferrous metals*

1. Smelting or processing of radioactive minerals

#### *(4) Special equipment manufacturing*

1. Weapons and ammunition production

#### *(5) Electronic machinery and equipment manufacturing*

1. Open-cell (with direct discharge of acid mist) lead acid batteries, silver-oxide button batteries with mercury, mercury alkaline manganese button batteries, mercury paste-type zinc-manganese batteries, and nickel-cadmium batteries

#### *(6) Industrial and other manufacturing*

1. Ivory carvings
2. Tiger-bone processing
3. Bodiless lacquerware production
4. Enamel products manufacturing
5. Xuan paper and Chinese ink ingots

6. Manufacture of carcinogenic products, those that cause deformities or mutations, or those that emit permanent organic pollutants

#### **IV. Electricity, Gas, and Water Production and Supplies**

1. Construction and operation of coal-fired, steam-condensing power plants with single-machine capacity of less than 300,000 kW, or coal-fired, steam-condensing power heating units with single-machine capacity of less than 100,000 kW (small power networks are excluded)

#### **V. Transportation and Shipping, Warehousing, and Post and Telecommunications**

1. Air traffic control companies
2. Postal companies and domestic express mail services

#### **VI. Leasing and Business Services**

1. Social research surveying

#### **VII. Scientific Research, Technology Services, and Geographic Survey Industries**

1. Research, development, and application of stem cell and genetic diagnosis and treatment technology
2. Geodetic survey, ocean mapping, aerial photographic surveys, plotting of administrative district borders, drawing up of topographic, basic, and digital navigation maps

#### **VIII. Water Conservancy, Environment, and Public Infrastructure Management Services**

1. Construction and operation of national natural reserves and internationally recognized wetlands
2. Development of nationally protected indigenous animal and plant species

#### **IX. Education**

1. Compulsory education institutions and military, police, political, party, and other educational institutions in special categories

#### **X. Cultural, Sports, and Entertainment Companies**

1. News organizations
2. Publication of books, newspapers, or magazines
3. Publication and production of videotape products and electronic journals
4. All administrative levels of radio broadcasting channels or stations, television channels or stations, and television transmission networks (including transmission stations, relay stations, TV broadcast satellites, satellite uplink stations, satellite receiver platforms, microwave stations, monitoring platforms, and cable television transmission coverage networks)
5. Radio and television production companies
6. Film production and distribution companies and cinemas
7. News websites, web streaming audio-visual services, locations with Internet-access services, and administration of culture-related aspects of the Internet (music excluded)
8. Construction and operation of golf courses and villas
9. Gambling industry (including horse racing)
10. Pornography industry

#### **XI. Miscellaneous**

1. Projects that endanger the safety or performance of military installations

#### **XII. Other industries prohibited by the state or by international treaties for which China adheres or has ratified**



