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吉林 JILIN

NEW OPPORTUNITY

新机遇



Photoelectric Information and other New
& High-tech Industries

光电子信息等高新技术产业

吉林省人民政府新闻办公室
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Government of Jilin Province

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NEW OPPORTUNITY
新机遇

总策划 / 主编 姜凤国

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吉林·新机遇

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Jilin · New Opportunity

—Photoelectric Information
and other New & High-tech
Industries

总策划 / 主编

姜凤国

副主编

刘乃季

策划

郭颖 刘长录 杨有海

行业顾问

吉林省信息产业厅

副主编 (执行)

刘长录

撰稿

王君 郭凤城 朱斌

译审

宋力英 李增

翻译

田园

编务

李向忠

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总 序

General Preface

橘黄橙红正此时

谨以此书献给关注吉林经济振兴的朋友们

亲爱的朋友,当您触摸这套丛书的时候,您也许已沉入对吉林的美好回忆:耳畔回荡的是松花江滔滔流水,眼前浮现的是长白山滚滚松涛,画面上还不时叠印出“东北三宝”——人参、貂皮、鹿茸角……

您也许没来过吉林,但和她“神交”已久:您渴慕这片神奇的土地,您关注这里的经济运行态势。或许在股票交易的电脑按键上,您早已熟练地操作买进卖出窜红的“一汽轿车”、“吉林化工”、“通化东宝”、“吉林敖东”……

您可能是位外国友人,这是第一次踏上吉林的土地。那就让我轻轻地告诉您,您赶上了这个地方最美的季节——一个金秋收获的季节,飒飒作响的大豆向您敲起欢迎的锣鼓,漫山遍野的玉米正向您颔首致意……

您翻阅这套丛书,可以了解吉林支柱和优势产业发展的现状与未来,可以透视吉林产业优势与劣势背后蕴藏的商机,也许这些能为您提供千载难逢的创业机遇。不论您是浏览观光,还是投资兴业,我们都乐意向您敞开胸怀、袒露心扉,热诚地欢迎您,并希望您参与吉林的开发与建设,和我们一起在这片热土上齐耕耘、共收获。

两年前,党中央、国务院审时度势,作出了振兴东北老工业基地的战略决策——这是继沿海经济特区设立、上海浦东开发开放和西部大开发之后,于21世纪初从全面建设小康社会全局着眼作出的又一重大战略决策。东北人民为之振奋!吉林人民为之振奋!海内外的朋友们为之振奋!

这是新一轮开发热潮,这是新的一场“吉林再造”!

“要用新思路、新体制、新机制、新方式,走出加快老工业基地振兴的新路子”——国务院总理温家宝有针对性地提出了总体要求,对东北振兴寄予殷切的期望。

“抓住机遇,加快发展,振兴吉林,富民强省”、“使吉林经济发展‘变快走为快跑’”——这是中共吉林省委、吉林省人民政府对中央作出的积极回应,对2700万吉林人民发出的“世纪动员”!

我们说,在新一轮竞争中,吉林具有“后发优势”。从产业上看,我们最大的优势在于加工制造业。经过50多年的建设和发展,吉林已在汽车工业、石化工业、农产品加工业、医药工业以及光电子信息等高新技术产业五个方面打下了雄厚的基础,其主导产品饮誉国内,畅销海外。加快建设上述五大产业基地,已作为统一意志,纳入《振兴吉林老工业基地规划纲要》之中。何为“后发”?不甘人后的吉林人,在清楚地知道自己在上一轮竞争中落后,而新机遇又来到眼前时,那种深藏在心底的冲动,那种一显身手的豪情,那种破釜沉舟的气魄,那种背水一战的决心,都将化作改天换地的巨大力量!

我们欣喜地看到,作为“支柱”和“优势”,五大产业生机勃勃,基地建设雏形显露:

汽车工业发展风驰电掣——

1953年7月15日毛泽东主席亲笔题词,中国第一汽车制造厂在长春奠基。从此,吉林的发展就与汽车工业紧密地联系在一起。50多年来,这位“共和国长子”负重前行,引领着吉林“汽车经济”在快车道上疾驰,形成了以一汽为核心、集整车、各类专用车和汽车零部件研发、生产、贸易为一体的产业体系,2004年汽车工业总产值达1416亿元,成为引领吉林省经济发展的“龙头老大”。吉林将全力支持一汽做大做强,扩大整车规模,整合现有零部件企业资源,增强零部件配套能力,积极发展汽车贸易和服务业。“汽车”,将继续成为吉林工业经济的领跑者……

石油化工工业谱写新篇章——

1957年建成投产的“吉化”，是新中国最早的特大型化工联合企业。投产时中国官方最权威的《人民日报》曾发表题为《我们要建设强大的化工工业》的社论。以此为动力，吉化一路高歌。以30万吨乙烯及其配套装置建成投产为标志，吉化再次向世人展示了它不可撼动的地位。吉化人自称“经历了半个世纪的逐浪长歌，打响了新时代的世纪之战”。在今后的发展中，吉林将以吉化公司、吉林油田为龙头，在优化结构、扩大规模、提高效益上下功夫，积极发展精细化工、高性能合成材料和特种材料，提高加工制成品比重，提高原油产量和原油加工能力。这条战线上，还将高奏《创业》的旋律……

农产品加工业正方兴未艾——

吉林省地处世界闻名的“黄金玉米带”，也是久负盛名的“大豆之乡”，玉米人均占有量、商品量、调出量、出口量连续多年位居全国首位。这个前几年让人不屑一顾的“丑姑娘”，近几年陡然变“俏”，成了市场上的追捧对象，“卖粮难”已成为历史。这都是“转化升值”立下的大功。早在2003年，吉林省就封闭推广车用乙醇汽油，主要原料就是吉林盛产的玉米。全国著名的农业产业化龙头企业——长春大成集团还提出了“玉米‘替代’石油战略”，开始策划从玉米中提炼多元醇、聚酯纤维等化工产品，一个年产20万吨化工产品的工厂正在紧锣密鼓地建设。玉米，这个曾经因储不下卖不出的“包袱”正在转变成资源优势，通过“过机”转化，催生出石化、燃料、食品等重要产业。吉林漫山遍野的大苞米，已经变成富民强省的“金豆子”。有人预言：不出五年，吉林省每年200多亿公斤的玉米就不够用了。目前，吉林正在依托丰富的农副产品资源和绿色生态优势，大力发展玉米大豆深加工、畜禽乳深加工、长白山生态食品三大产业，延长产业链，提高附加值。看来，这个“老三”大有追上“老大”的趋势……

医药产业已成燎原之势——

长白山物华天宝，中药材占全国总量的三分之一。2000年6月，国家批准在吉林省建立中药材现代化科技产业基地，与“南药”之都——四川形成南北呼应之势，共担振兴中药大业。五年来，吉林厉兵秣马，攻城掠地，写下了跨越式发展的辉煌篇章：中成药工业的产值、工业增加值、利润、税收等四项指标均居全国前列，生物制药整体水平已居全国领先地位。随着吉林敖东、通化东宝等企业的上市，长白山医药声名鹊起！在医药产业的发展上，吉林将依托长白山北药资源和生物技术优势，突出发展现代中药和生物药产业，着力提高自主研发能力，推进企业重组，改进生产工艺，实现产业升级。我们将扛起“北药”不倒的大旗……

光电子信息等高新技术产业异军突起——

长春是中国光电事业的摇篮。中国科学院长春光机研究所是我国光学领域最大的研究所，自1952年建所以来，已取得了1400多项科研成果，创造了10余项“中国第一”，为国家培养了2200多名光学人才，王大珩、母国光、丁衡高等20多位院士都在这里工作过。改革开放以来，吉林光电子信息等高新技术产业突飞猛进，已形成可以雄视天下的产业集群。如今，行业内聚集了一批高水平的科研机构，开发出了一大批高水平的科研成果并已形成生产能力。其中吉林大学、长春应化所、长春光机所在有机发光显示器件与材料研究方面位居国内前列，已有十几项成果获国际国内发明专利……吉林将以长春国家光电子产业基地为核心，重点发展光电子信息及软件产业、新型材料等高新技术产业，实现规模、市场、效益等方面的突破。可以预见，经过我们的努力，这个产业必将闪耀出更加夺目的光辉……

振兴吉林老工业基地，是历史赋予我们的重任。我们要在建设好五大产业基地的同时，大力培育和发展能源、冶金、建材、纺织等传统产业和旅游业。十大产业竞相发展，相映成辉，一幅中国东北新型工业基地的壮丽画卷，必定会展现在您的面前。

最是一年秋好处，橘黄橙红正此时。

投资吉林真慧眼，二次创业更风流。

愿我们携手共进，同创吉林伟业！

It is right time for oranges to become ripe

—— Dedicated to those friends who pay close attention to
the revitalization of the economy in Jilin Province

Dear friends, when you touch the series of the books, maybe you will indulge yourself in the sweet memories of Jilin Province: the surging Songhua River reverberating in your ears, the rolling pines and birches in the Changbai Mountains appearing before your eyes with the frequently overlapping recurrence of “The Three Treasures of North-east China”---ginseng, marten and pilose antler...

Maybe you have never been to Jilin Province, but you have been her “friend with mutual understanding and admiration” for long: You are eager to set foot on the miraculous land, and you pay close attention to the running trend of the economy here. Maybe in the stock exchange hall you can skillfully press the keyboard of the computer to buy or sell the sudden popular shares such as those of “The First Automobile Works”, “Jilin Chemical Group”, “Tonghua Dongbao”, “Jilin Aodong”...

Maybe you are a foreign friend, and this is the first time for you to set foot on Jilin Province. If so, I'd like to tell you that you are here in the most beautiful season---the golden autumn of harvest: The rustling soybean plants are welcoming you with drums and gongs, and the maize plants all over the mountains and plains are nodding to greet you...

Looking over this series of books, you will know the present state and the future of the pillar industries and advantageous industries in Jilin Province, and it will help you lose no time in taking the golden opportunity of starting enterprises here? Whether you are a tourist or you are here to invest in enterprises, we are glad to welcome you warmly with opening arms and ready to open our hearts and tell the things that you would like to know, and we hope that you can plough and harvest together with us in the fertile land by participating in the development and construction of Jilin Province.

Two years ago the Central Committee of the Communist Party of China and the State Council made a strategic decision of revitalizing the old industrial base of northeast China after a correct assessment of the situation---another great strategic decision made at the beginning of 21st century for building a well-off society in an all round way after the establishment of coastal economic special zones, the development and opening of Pudong in Shanghai and the extensive development of west China. The people of northeast China are encouraged! The people of Jilin Province are encouraged! Friends both at home and abroad are encouraged, too!

This is another great opportunity of development and another round of “reformation of Jilin Province”. “With new thinking, new system, new mechanism, new style, open up a new way to speed up the revitalization of the old industrial bases.” ---This is demanded by Premier Wen Jiabao and also his ardent expectation for the revitalization of northeast China.

“Take opportunities, speed up development, revitalize Jilin Province, strengthen the province by enriching the people” and “develop Jilin’s economy at a full speed”---This is the active response from Jilin Provincial Committee of the Communist Party of China and Jilin Provincial Government after the correct assessment of the situation in the Province as a whole, and it is also a “centennial mobilization” to 2.7 million people of Jilin province.

We can say that in the new round of competition, Jilin Province has its own “advantages of late development”. Our greatest advantages are in processing and manufacturing industries. After more than fifty years’ construction and development, Jilin Province has laid a solid foundation in the five industries such as automobile industry, petrochemical industry, agricultural product processing, pharmaceutical industry and photoelectronic information industry, and the leading products sell well at home and abroad. As a unanimous determination, To accelerate developing the above five industrial bases has been listed in “The Planning Outline of Revitalizing Old Industrial Bases of Jilin Province”. What is “late development with great promise”? The people of Jilin Province, who are not content to lag behind, clearly know that they fell behind in the past competition and now the momentum deeply hidden at the bottom of heart, the lofty sentiments of giving full play to their abilities, the daring spirit of burning their boats and the determination of fighting without retreat can really become a tremendous epoch-making driving power!

We are glad to say that with the great advantages, the five industries of Jilin province are flourishing and the construction of the bases have taken their good shape.

The automobile industry develops at a high speed---

On July 15, 1953 Chairman Mao Zedong inscribed his own words and the foundation stone of the First Automobile Works was laid in Changchun. Since that time the development of Jilin Province has been closely associated with automobile industry. For more than fifty years "the first son of the People's Republic of China" has been advancing with the great task and it has been leading the "automobile economy" of Jilin Province on the fast track. As the leader, the First Automobile Works is the center of the industrial system which integrates the research and development, production and trade of whole vehicles, assorted specialty cars and automobile parts. In 2004 the total output value of the automobile industry amounted to 141, 600,000,000 Yuan. Jilin Province will give all-out support to the First Automobile Works when it strives for its enlargement and great strength by increasing the scale of whole vehicle production, integrating the resources of automobile part enterprises to reinforce the matching capacity of automobile accessories and actively developing car trade and service industry. "Automobiles" will continue to be the pacemaker of the industrial economy in Jilin Province.

New pages of petrochemical industry---

"Jilin Chemical Corporation" which was founded and went into operation in 1957 was the earliest oversize chemical joint enterprise in new China. When it put into production, the most authoritative official newspaper People's Daily in China issued an editorial entitled "We Are to Establish Strong Chemical Industry". Driven by this impetus, Jilin Chemical Corporation develops well all the way. The completion of the construction and the operation of ethene factory with the production capacity of 300,000 tons of ethene per year and also the completion of the matching facilities as a mark, Jilin Chemical Corporation once again shows its unshakeable position to the whole world. The working people of Jilin Chemical Corporation claim that "they must have a good start in the competition of the new century after the long hardworking". In the coming development, Jilin Province will lay a special emphasis on Jilin Chemical Corporation and Jilin Oil Field and we will make great efforts to optimize the structure, enlarge the scale and upgrade profits. Industry of fine chemicals, synthetic materials of high performance and materials of special type will be actively developed, the percentage of processed products and finished products will be raised, the output of crude oil increased and oil refining capacity strengthened. The development in this field will continue.

The ascending agricultural product processing industry---

Jilin Province is located in the world-famous "Golden Corn Belt", and it is also long called "Hometown of Soybean". The per capita possession, the volume of commodity, the volume of sending and the export volume of corn have been holding the first place for many successive years in China. The "coarse food grain" which people would not spare a glance at several years ago has become goods in great demand as a best seller in the market in recent years and the difficulty of selling corn has passed. This largely owes to the "Transformation and Rise in Value". As early as in 2003, Jilin Province alone began to popularize the use of ethanol gasoline in cars, and the main raw materials is maize that Jilin Province produces abundantly. The national-famous leading enterprise in agricultural industry, Changchun Dacheng Group advocates "Strategy of 'Substituting' Oil for Maize" and is planning to extract such chemical products as polyalcohol and polyester fiber. To this end a factory that can produce 200,000 tons of chemical products is being built in full swing. Maize, once a "burden" that did not have enough space to store in and could not be easily sold is changing into a valuable resource, and after transformation "through machine" such important industries as petrochemical industry, fuel industry and food industry have been brought forth. Maize, which grows all over the mountains and plains, has become "golden peas" that can enrich the people and strengthen the province. It is predicted that within five years 20,000,000,000 kilograms of maize produced in Jilin Province cannot be sufficient. At present Jilin Province is devoting great efforts to develop the three industries including deep processing of maize and soybean, that of livestock, poultry and milk and Changbai Mountain ecological food industry on the basis of the rich agricultural products and sideline products, and the advantages of the green ecological products there as well with the aim of lengthening industrial chains and raising added value. It seems that "The Third" is highly likely to catch up with "Mr Big".

The pharmaceutical industry develops in a large scale---

Teeming with exquisites and natural treasures, Changbai Mountain occupies one third of the total Chinese Medicinal herbs in China. In June, 2000, the state ratified to establish the modern scientific and technological industrial

base of traditional Chinese medicinal materials in Jilin Province, which echoes the capital of "South Medicine"---Sichuan in the south, and they both shoulder the great task of revitalizing traditional Chinese medicine. For five years Jilin Province has been making an all-out effort to spread the industry and the glorious chapter of spanning development has been written down. The four quotas of the output value, the industrial added value, the profit and tax revenue of the traditional Chinese medicinal industry, are all at the forefront of its kind in the country and as a whole the level of biopharmaceutical industry is in the leading position in China. With the appearance of Jilin Aodong and Changchun Dongbao, Changbai Mountain medicine suddenly becomes famous. Relaying on the north China's traditional Chinese medicinal resources in Changbai Mountain and the advantages in biological technology, Jilin province will work hard to develop the industries of modern traditional Chinese medicine industry and biopharmaceuty and we will maice great efforts to enhance ability of self research and development, to push on the reorganization of enterprises, to improve manufacturing techniques so that the industries can be upgraded. We believe that the medicine industry of north China must be better and better.

Boom in the photoelectronic information industry and other new and high-tech industries ---

Changchun is the cradle of the photoelectronic industry in China. Changchun Research Institute of Optical Instruments Attached to Chinese Academy of Science, the biggest research institute in the optical field in China, has made more than 1,400 achievements in scientific research, gained more than 10 "breakthroughs in China", and cultivated more than 2,200 optical scientists and technicians since 1952 when it was founded. More than 20 academicians have ever worked in the institute, including Wang Daheng, Mu Guoguang and Ding Henggao, etc. Since the reform and opening to the world, photoelectronic information industry and other new and high-tech industries in Jilin Province has been making giant strides and the industrial clan that gains the advantageous position have been formed. Nowadays a group of scientific research institutions muster in the field. Of those institutions Jilin University, Changchun Institute of Applied Chemistry and Changchun Institute of Optical Instruments are at the forefront in organic luminescence display devices and the related materials in China. So far more than 10 achievements have obtained patents for inventions either at home or abroad... With Changchun National Base of Photoelectronic Industry as the focus, Jilin Province will stress the development of such new and high technology industries as photoelectronic information and soft ware industry, new material industry with the aim of making breakthroughs in scale, markets and profits. It can be predicted that with our own efforts this industry is bound to flash with the rays of dazzling brilliance.

The great task of revitalizing the old industrial bases of northeast China is what history has entrusted to us. Constructing the five big industrial bases, at the same time, we will make great efforts to develop the other traditional industries of energy sources,metallurgy, building material,weave and tourism.The ten industries complement each other and develop together. We believe that a splendid picture of the new industrial base in northeast China will appear before your eyes.

It is the best part of autumn, the right time for oranges to become ripe.

Investment in Jilin Province proves your good insight, starting an enterprise again shows your magnetic spirit.

It is hoped that we can go hand in hand, make great careers in Jilin together.

吉林省光电子信息等高新技术产业发展回顾

Retrospection of New and High-tech Industry Development on
Photoelectric Information in Jilin Province

高新技术产业是一个大概念和范畴,涵盖的范围比较广,而且国内国际对此具有不同的界定和分类。国内的高新技术产业一般包括电子信息产品制造、软件、通信、邮政、生物、新材料、新能源、海洋、航空航天等技术产业部门,吉林省的高新技术产业主要包括信息产业、生物产业、新材料和现代农业。在振兴老工业基地等战略规划和工作部署中,吉林省提出要把光电子信息等高新技术产业作为全省的优势产业之一加以培育,并将其列为重点建设的“五大产业基地”之一,而将生物产业、新材料和现代农业等分别划入医药产业、化工产业等行业。因此,本书介绍的吉林省光电子信息等高新技术产业主要包括光电子信息产品制造业、信息服务业和软件业等。

吉林省电子工业是在新中国成立后发展起来的一门新兴工业,随着国民经济的发展和科技进步,经历了一个从小到大的发展过程。改革开放以后,吉林省在电子工业发展的基础上,光电子信息等高新技术产业逐步壮大起来,并成为全省的优势产业之一。特别是近年来,光电子信息等高新技术产业的行业结构、产品结构趋于合理,产品产量大幅度增加,经济效益越来越好,形成了一批特色产品和骨干企业,已经成为吉林省国民经济发展中的重要组成部分。吉林省电子工业以及后来在此基础上发展起来的光电子信息等高新技术产业,主要经历了以下几个发展阶段。

电子工业起步阶段:20世纪40年代末至70年代末。新中国的成立给吉林省电子工业带来了无限生机。1950年,东北人民政府将沈阳东北人民广播器材厂搬迁至长春,这是有史以来吉林省自己的第一家电子工业企业,主要生产扩音机、收音机、舌簧喇叭等产品。到1954年,东北人民广播器材厂由刚迁来时的38人发展到400余人,产品除供应东北地区外,还销往河北、内蒙古等地,供不应求。与此同时,在手工业改造中,长春、吉林等

High and new technology industry is a general concept covering various fields. It has many different definitions domestically and internationally. Domestic high and new technological industries include technological industries such as electronic information products manufacturing, software, communication, post, biology, new materials, new energy source, ocean aviation and spaceflight etc. High and new technological industries in Jilin Province include information industry, biology industry, new materials and modern agriculture. In strategic planning and work disposition for the rejuvenating old industrial bases, Jilin Province proposes to develop photoelectric information industry as one of the predominate industries and also lists it as one of the key "Five Great Industry Bases", while classifies biology industry, new materials and modern agriculture into medicine, chemistry and some other industries. Therefore, this book will mainly introduce high and new technological industries like photoelectric information in Jilin Province including photoelectric information products manufacturing, information services, software, etc.

Developing as a new industry after the foundation of new China, electronics industry in Jilin Province has developed from a small industry to a large one with the development of national economy and the improvement of science and technology. After the reform and opening-up, based on the development of electronics industry, high and new technological industry like photoelectric information is expanding steadily and finally becomes one of the predominant industries in Jilin Province. Especially in recent years, the industrial structure and product structure tend to be more reasonable. The productive output and economic benefit are increasing greatly, so photoelectric information industry has developed some characteristic products and leading enterprises. It has become an important part of the national economy of Jilin Province. The electronics industry and other high and new technological industries like photoelectric information industry that developed on its basis experienced several stages in development as follows.

The stage of the start and development of electronics industry: (from the late 1940s to the late 1970s)

城市还组建了一批无线电修配合作社(组),主要维修收音机、扩音机、麦克风,有的还能自制线圈、变压器等零部件。1958年至1966年,按照国家统筹规划和布局,吉林省电子工业的基础产品、整机产品都得到一定的发展,吉林省电子工业初具规模。1958年6月,第一机械工业部决定在长春市西南郊兴建长春无线电工业区,开始建设国营东北电子管厂、东光无线电器材厂、无线电整机厂、半导体材料厂和无线电工业学校,并于1965年建成投产和投入使用。这期间吉林省电子企业厂点一度达到30多个,但由于产品质量次价高,后来绝大多数厂点都被淘汰了。1963年10月,第四机械工业部又在吉林省建设了长春半导体厂、白城无线电厂、吉林市无线电厂、辽源市无线电厂。经过几年的努力,这些企业先后建成投产,后来成为吉林省电子工业的骨干企业。同时研制生产了袖珍式半导体收音机、手摇发电机、变压器、半导体针疗器、普通灯泡等电子产品以及电容器、晶体管等基础产品,还试制出参量放大器、自动空气干燥机、砷化镓微波器件等30多个品种。

“文化大革命”期间,吉林省电子工业受到阻碍,在曲折中得到了一定的发展。1966年8月,吉林市无线电厂、通化市电子仪器厂等搬迁到“小三线”地区。但“小三线”建设并没有取得预想的效果,一部分被淘汰,只有半导体器件厂、无线电元件厂和无线电整机厂等少部分骨干企业被保留下来。吉林省无线电厂于1970年更名为长春市无线电一厂,是省内电子行业重点企业,主要生产收音机、电视机等整机产品。吉林市电视机厂是由吉林市广播局服务部发展起来的电视机生产企业。吉林市电子仪器厂是电子工业部定点的无线电元件测试仪器专业厂,能够生产广播音响产品和无线电电子仪器。到1978年末,全省电子工业厂点达到109个,职工23440人,能生产民用整机、电子测量仪器、电子元器件等产品共11类300多个品种。

电子工业大发展和信息产业形成阶段:

new China's establishment brought new life to Jilin electronics industry. In 1950, Shenyang Northeast People Broadcasting Equipment Factory was moved to Changchun by Northeast People's Government, which is the first electronic industrial enterprise in history owned by Jilin Province. It mainly produced louder-speakers, radios and armature loudspeakers, etc. By 1954, its staff members had grown from 38 people from the beginning into more than 400. Its products were sold not only in northeast regions but also far to Hebei, Inner Mongolia, etc. And the supply of its products often fell in short of demand. Meanwhile, during the transformation of handicraft industry, many cities like Changchun and Jilin set up radio repairing and making cooperatives, mainly repairing radios, enlargers, microphones and some cooperatives could even make coils and transformers on their own. From 1958 to 1966, according to the national planning and layout, the basic products and complete machine products of Jilin electronics industry obtained certain development and Jilin electronics industry began to take shape. In June of 1958, the First Ministry of Mechanical Industry decided to build Changchun Radio Industrial Zone in the southwest suburbs of Changchun and establish state-owned Northeast Vacuum Tube Factory, Dongguang Radio Equipment Factory, Radio Complete Machine Factory, Semiconductor Material Factory and Radio Industry School, all of which were completed and put into production and used in 1965 after seven years of construction. During this period, the number of electronics industrial enterprises increased to over 30, but most of them were eliminated later because of poor quality and high price. In October of 1963, the Fourth Ministry of Mechanical Industry began to build Changchun Semiconductor Factory, Baicheng Radio Factory, Jilin City Radio Factory and Liaoyuan City Radio Factory. After several years of hardworking, these enterprises were completed and put into production one by one, and finally, developed into the leading enterprises of the electronics industry of Jilin Province. They developed and produced such electronic products as pocket transistor radio, hand operated engine, transformer, semiconductor needle cure and bulb, and many basic products such as capacitor and transistor, and tried out more than 30 types of products like parametric amplifier, automatic air dryer, gal-

20世纪80年代初至90年代中。改革开放以后,吉林省电子工业进一步走上振兴之路,特别是经过“六五”、“七五”期间的调整 and 改革,全省电子工业得到迅速发展,以光电子信息为代表的高新技术产业也逐渐成为全省电子工业的主体。这一时期,根据中央精神对省属“小三线”企业进行了调整,搬迁并下放给地方管理,对不具备生产条件、难以扭亏为盈的企业,实行“关、停、并、转”。到1983年末,全省电子工业厂点压缩到71个。其间,对产业布局和产品结构进行了调整,长春市侧重发展微波器件、电子元件、激光器、发光器件及雷达、彩色电视机、汽车电子产品等,吉林市侧重发展固体激光材料、硅低频大功率器件、稀土永磁合金材料、铝电解电容器以及电视机、汽车收音机、自动化仪表等产品。同期,全省电子行业技术引进和技术改造步伐加快,先后从日本、美国、西德、荷兰、加拿大、英国、新加坡、波兰等国家引进了26个项目。其中发光器件、大功率晶体管、铝电解电容器、集成电路、彩色电视机等项目的引进投产,使全省形成了新的生产能力,固定资产原值从1980年的1.5亿元增加到1985年的2亿元。企业研发能力有所提高,1981年至1985年累计鉴定科研新产品207项,获国家、部级科研成果奖20项,获省级奖35项。稀土永磁合金性能达到国内先进水平,低频大功率器件热疲劳性能列国内同类产品首位,发光器件和微波器件在国内处于领先地位,YAG激光晶体是国内电子行业独家产品。截止1985年底,全省电子工业企业事业单位共有83个,职工总数24364人,固定资产原值19106万元,净值12955万元,当年完成工业总产值39582万元,实现利润3372万元。产品覆盖了通讯设备、彩色电视机、黑白电视机、收录机、汽车收音机、集成电路、半导体器件、无线电子元件、仪器仪表、专用设备、汽车电子等包括投资、消费、元器件17个门类425个品种,有54项产品获省优质产品奖,有40多项产品达到国内同类产品先进水平。

lithium arsenide microwave device.

During the Cultural Revolution, the electronic industry of Jilin Province met some difficulties but still obtained certain development. In August of 1966, Jilin City Radio Factory, Tonghua Electronic Instrument Factory, etc. were moved to "small three lines" areas. However, the construction of "small three lines" did not meet the expectation, so some of them were washed out and only a few leading enterprises such as Semiconductor Component Factory, Radio Component Factory and Radio Complete Machine Factory were reserved. Jilin Province Radio Factory changed the name for the First Changchun Radio Factory in 1970, which was a key electronic industrial enterprise in Jilin Province and mainly produced complete machine products such as radios and TV sets, etc. Jilin City Television Factory, a TV manufacturing enterprise, developed from Jilin City Broadcasting Bureau Service Department. Jilin City Electronic Instrument Factory was a specialized factory pointed by Ministry of Electronic Industry for testing radio components and could produce broadcast sound products and radio electronic appliance. By the end of 1978, there had been 109 electronic industrial factories, 23,440 employees in Jilin Province and they could produce more than 300 kinds of products covering 11 categories such as civil complete machines, electronic measuring devices and electronic components, etc.

The stage of great development of electronic industry and the forming of information industry: (early 1980s-mid 1990s) After the reform and opening-up, the electronic industry of Jilin Province took a further step on the rejuvenation road. Especially, the "Sixth Five-Year Plan" and the "Seventh Five-Year Plan" brought a rapid development for electronic industry in the whole province. High and new technological industry represented by photoelectronic information industry gradually became the main body of electronic industry in the whole province. During this period, according to the spirit of CPC, provincial "small three lines" enterprises were moved, adjusted and transferred to local governments. As for those small enterprises which possessed no productive conditions and could hardly make up deficits, the government carried out

光电子信息等高新技术产业大发展阶段：20世纪90年代中后期至今。“九五”期间，吉林省电子信息产品制造业有了较快的发展，平均增长速度超过44%，实现工业总产值由1995年的16亿元上升到2000年的100.16亿元，呈几何级增长态势；工业增加值占全省GDP的比重达到0.65%；实现利税由1995年的-3200万元上升到3.6亿元。截止2000年底，全省电子信息产品制造业共有企业55户，其中大中型企业18户；职工人数25720人，其中工程技术人员3088人；出口创汇1.6亿元，在全国同行业中列13位。主要产品有彩色电视机、程控交换机、液晶显示器件、半导体分立器件、片式元器件、稀土永磁材料、计算机、空调器等。其中TFT—LCD液晶显示屏填补了国内空白，半导体大功率器件的科研、开发、生产在国内居领先地位，已初步形成了具有一定产业规模和技术创新能力的以光电子、液晶显示、新型元器件、汽车电子、计算机应用软件为主导产品的产业格局和体系。

这期间，吉林省电子信息产品制造业的发展最为迅猛。有吉林特点、有市场，能够发挥比较优势的光电子、汽车电子、消费类电子产品、新型整机及元器件、视听网络产品，在规模较低的基础上得到了较快发展。产业结构得到调整，到2003年，投资类、消费类、基础类3大类产品比重已调整为52:20:28，投资类产品所占比重明显提高；产品结构得到优化，光电子、汽车电子及新型元器件等主要产品产量迅速增加，产品生产不断向高技术、高品质、高附加值方向发展。软件业得到了快速的发展，面向工商、财税、金融、证券、教育、电信、保险、粮食等行业的成套应用软件和系统软件得到了重点开发。几年来，全省软件产业年均增长速度达到了65%，2003年全省软件及信息服务业销售额突破了32亿元，销售收入占全省信息产业销售收入的比重逐年提高；从事软件研发、生产、销售和 service 的企业超过了260户，从业人员近万人；全省已初步形成了以长春软件

the policy of "close, stop, combination, transformation". By the end of 1983, factories of electronic industry in the whole province had been reduced to 71. Meanwhile, the industrial layout and products structure were also regulated. Changchun City stressed on the development of microwave devices, electronic components, laser, light emitting devices, radars, color TV sets, automobile electronic products, etc. Jilin City laid emphasis on the development of solid laser materials, silicon low frequency and high-power components, rare-earth permanent magnetic alloy materials, aluminum-electrolytic capacitors, televisions, automobile transceivers, automated measuring appliance, etc. At the same time, the speed in introducing and reforming the technology in electronics industry in the whole province was increased. 26 projects were successively introduced from Japan, America, West Germany, Holland, Canada, the Great Britain, Singapore, Poland, etc. Among these projects, the introduction and production of light emitting devices, high-power transistors, aluminum-electrolytic capacitors, integrated circuits, and color TV sets created new productive ability for Jilin Province. The original value of fixed assets increased from 150 million RMB in 1980 to 200 million RMB in 1985. The ability of enterprises in research and development was improved as well. The total amount of certificated new products from 1981 to 1985 was 207. Among them, 20 new products obtained state-level and ministerial awards for the achievements in scientific research and 35 obtained provincial awards. The performance of rare earth permanent magnetic alloy could reach the domestic advanced level; thermal fatigue property of low frequency and high power devices dwarfed products of the same category in the country; light emitting devices and microwave devices were in the lead and YAG laser crystal was a unique product in domestic electronic market. By the end of 1985, there had been 83 enterprises of electronic industry in the whole province. They had a staff of 24,364 people. The original value of fixed assets was 191,060,000 RMB; net value 129,550,000 RMB; the gross value of industrial output was 395,820,000 RMB in the year; the profit was 33,720,000 RMB. The products covered 17 categories and 425 kinds in investment, consumption and components such as communication equipments, color

园、吉林软件园为研发基地,以吉林大学、东北师范大学等高等院校为技术依托,以一汽启明、长春鸿达等13户重点软件企业为骨干的软件产业发展格局。产业基地集聚效应日益增强,光电子产业群、液晶产业群、新型元器件产业群、软件产业群正在形成,并成为光电子信息产业快速增长的带动力量。以区域性整体推进的方式和产业群、产业链的资源配置方式推进信息产业发展的特征更加明显。目前正在加快长春光电子国家产业基地、吉林省汽车电子产业基地、长春软件园、吉林软件园等基地和园区建设,现已形成了从基础研究、应用基础研究到工程技术研究、高新技术产业化等多学科综合性的知识创新体系和技术创新体系,建成了北方液晶工程研发中心和有机发光工程研发中心等两个国家级工程研发中心。

TV sets, black-and-white TV sets, cassette players, automobile transceivers, integrate circuits, semiconductor devices, radio components, measuring appliance and instruments, dedicated devices, automobile electron, etc. Among them, 54 products won the prize of provincial good-quality products and over 40 products achieved the advanced level of the same products in the country.

The stage for the great development of high and new technological industry like photoelectric information industry: (mid 1990s-nowadays) During the "Ninth Five-Year Plan", electronic information products manufacturing industry of Jilin Province developed rapidly with an average rate of growth over 44%. The gross value of industrial output increased geometrically from 16 billion RMB in 1995 to 10,016 million RMB in 2000. The proportion of the industrial added value is 0.65% of the GDP of the whole province and the profit tax income increased from 32 million RMB in 1995 to 360 million RMB. By the end of 2000, there had been 55 enterprises in electronic information products manufacturing industry, 18 of which were large-

and middle-sized enterprises; there had been 25720 staff members, 3088 of whom were engineers and technicians. Foreign exchange through exports amounted to 160 million RMB, ranking the 13th in the same field in the country. The main products were color TV sets, SPC exchanges, LCD components, semiconductor separation components, chip components, rare-earth permanent magnetic materials, computers, air-conditioners, etc. Among them TFT-LCD screens filled in the domestic blank. The research, develop-

ment and production of high-power semiconductor components were in the leading position in the country. Jilin Province has already formed the industrial layout and system with certain industrial scale and technological innovation capacity in the research, develop-



ment and production of the main products such as photoelectron, liquid crystal display, new components, automobile electron, computer application software, etc.

Meanwhile, the development of the electronic information products manufacturing industry of Jilin Province was the most rapid. Based on a small scale, advantageous products with Jilin characteristics and good market prospect like photoelectron, automobile electron, consumptive electronic products, new complete machine and components, audio-visual net products developed rapidly. The industrial structure was regulated. By 2003, the ratio among the products of the three categories of investment, consumption and foundation in the national economy in Jilin Province had been regulated to 52: 20:28. It is obvious that the proportion of products of investment is much higher. Products structure had been optimized. The output of main products such as photoelectron, automobile electron and new components increased rapidly and the production were developing on the trend of high technology, high quality and high added value. Software industry also took a rapid step, stressing on the development of complete set of application software and systematic software for industry and commerce, taxation, finance, bond, education, insurance, food, etc. In recent years, the growth of software industry in the province averaged 65% a year. In 2003, sales amount of software and information service industry surpassed 3200 million RMB. The proportion in sales income of information industry in the province was increasing year after year. There are more than 260 enterprises and nearly 10 thousand employees working for software research, development, production sales and services. Jilin Province has formed a development layout for software industry with the research and development base of Changchun Software Zone and Jilin Software Zone, the technical support from higher educational institutes like Jilin University and Northeast Normal University and with 13 leading enterprises of Changchun Qiming Company of FAW and Changchun Hongda Company. The accumulating effect of industrial bases is strengthened day after day, and the industrial clusters of photoelectron, liquid crystal, new components and software are being formed. They help

to develop the photoelectric information industry. More obvious was the development of information industry was put forward by regional drive on the whole and the resource allocation of industrial cluster and industrial chain. Presently, Changchun photoelectric national industrial base, Jilin Province automobile electronics industrial base, Changchun software zone, Jilin software zone and other bases and zones are being constructed in a quick step. A comprehensive innovation system of multi-subjects including the basic research, appliance basic research, engineering and technological research and the industrialization of high and new technologies has been formed. Presently, there are two state-level engineering and technological research centers: Beifang Liquid Crystal Engineering Research and Development Center and Organic Luminescence Research and Development Center.

