



TIN THANH GROUP

TIN THANH GROUP

"Faith can change your life"



- Biomass energy
- Closed-Circular Agro-Industry
- Waste-to-Energy
- Industrial gas production
- Technology Startup



Tin Thanh Joint Stock Group

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"Together - we save energy, reduce global emissions"

Preface

Tin Thanh Group is the early pioneer of the adoption of renewable energy to contribute for global carbon emissions. We aim to become a multi-business corporate that sustainably develop for a cleaner environment with a lower carbon-emission level.

Beside TinThanh Group efforts, the supports and cooperation of Our Partners, Our Customers throughout the years are the key elements leading to Our Success nowadays. In the future, we are looking forward to build more connections and companionship with our valuable customers around the world to achieve our Ambition - Vision - Mission together.



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INTRODUCTION

Tin Thanh Group has been working in Environment, Energy, H-tech Agriculture and Technology businesses for decades. Until now, Tin Thanh Group has become a multi-business corporation with many units of members.

Currently, we are supplying energy from reusable sources for over 40 industrial factories in Vietnam and around the world. In the present, Tin Thanh is executing a closed circular agriculture system on hundred thousand hectares of land rising sorghum with the aim to be the initiative in energy industry and circular agriculture.



VISION:

- ▶ *Become a sustainable development enterprise in circular hi-tech agriculture*

MISSIONS:



- ▶ *Re-create ineffective agricultural lands to enhance farmers' life quality.*
- ▶ *Implementing advanced technology into circular agriculture.*
- ▶ *Pioneering using renewable energy sources over fossil fuels in enterprises' industries and energy.*

AMBITIONS:



- ▶ *Generate clean and sustainable energy sources for domestic and global markets.*
- ▶ *Save energy and reduce global carbon emissions.*
- ▶ *Provide technology solutions for industries, agriculture and human resources management.*



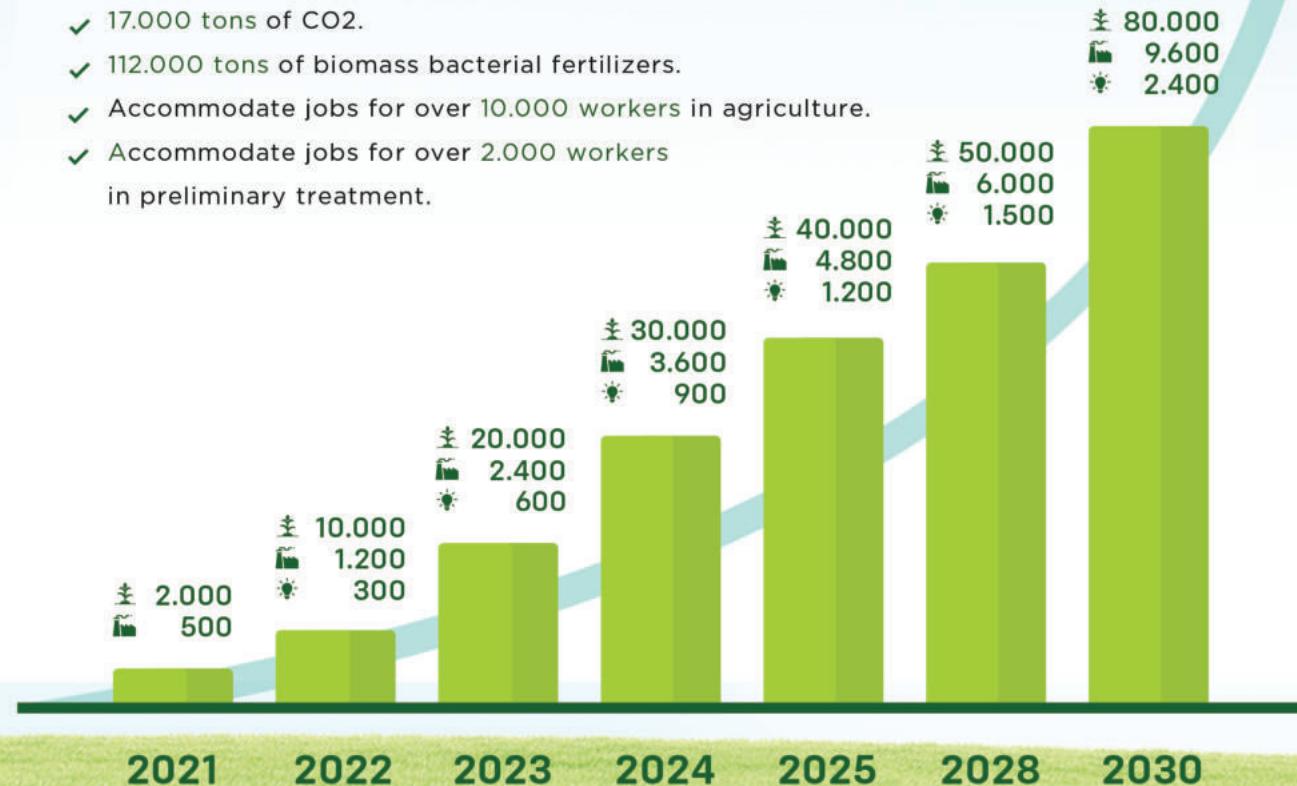
TIN THANH GROUP'S DEVELOPMENT PLAN FOR 2020-2030

🌾 Land area of sorghum (hecta)	♻️ Treated waste (tons/day)
🏭 Volume of air (tons/hour)	🌱 Microbial organic fertilizer (tons/day)
💡 Electricity (MW/hour)	

Using raw materials from sorghum

In only a year, 10.000 hectares of lands growing sorghum would create:

- ✓ 1,8 million tons of biomass fuels
(exchanged into 2,4 billion kilowatt of electricity).
- ✓ 60.000 milion liters of Syrup.
- ✓ 192 milion liters of Syrup.
- ✓ 24 million liters of 96 Alc alcohol for food industry.
- ✓ 24.000 tons of animals' foods
- ✓ 17.000 tons of CO2.
- ✓ 112.000 tons of biomass bacterial fertilizers.
- ✓ Accommodate jobs for over 10.000 workers in agriculture.
- ✓ Accommodate jobs for over 2.000 workers in preliminary treatment.



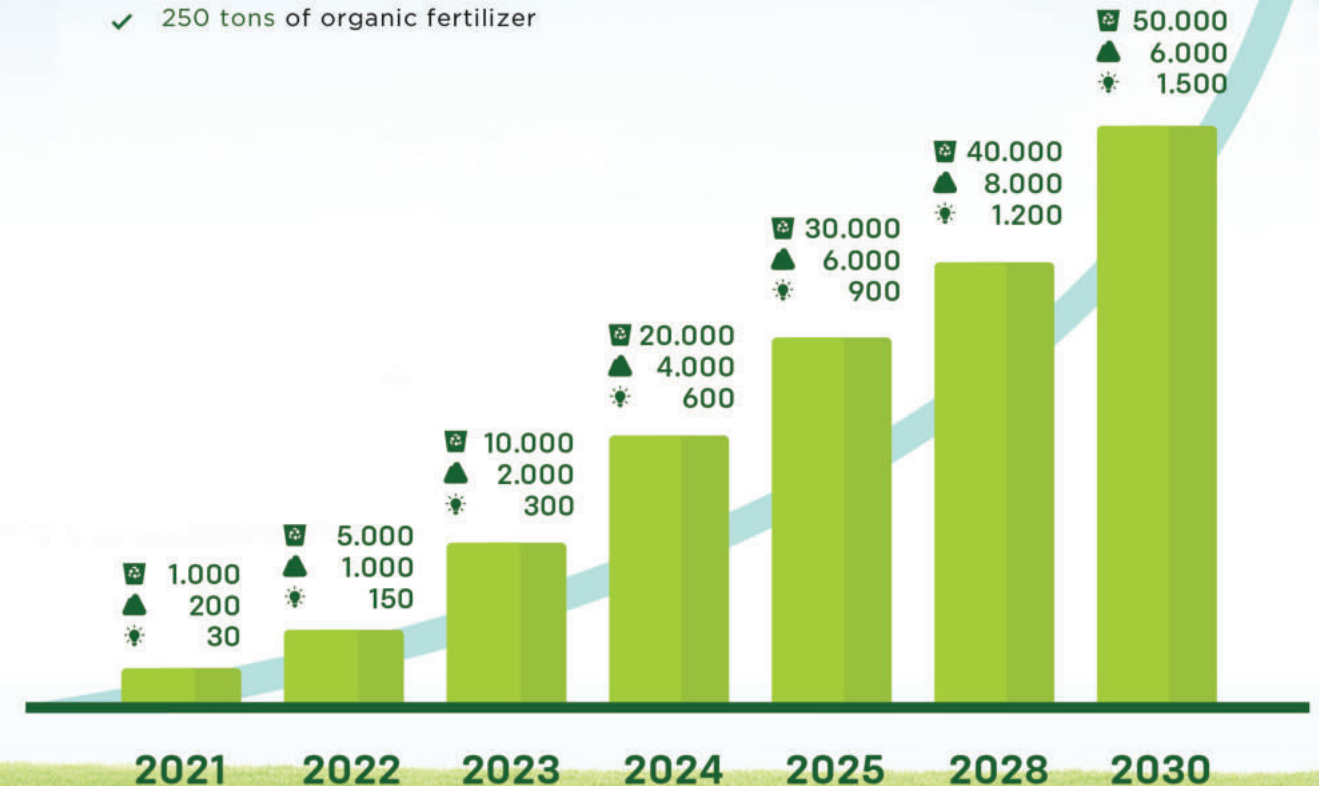
Using raw materials from both daily and perennial andfill household/industrial waste

Every 1,000 tons of perennial buried waste will produce:

- ✓ 250 tons of RDF fuel, 4500 Kcal calorific power
- ✓ 200 tons of organic fertilizer with up to 25% organic content.

Every 1,000 tons of long-term buried waste will produce:

- ✓ 300 tons of RDF
- ✓ 250 tons of organic fertilizer





ESTABLISHMENT AND DEVELOPMENT



2009



2010



2015



2020

- 2009** First factory loacted in Bien Hoa 1 Manufacturing area.
- 2010** Disruptively develop to 10 factories in 1 year.
- 2015** Over 40 factories in Vietnam and around the world. Take the U.S sorghum to hybridize and grow in Vietnam
- 2020** Aim to sustainably develop scopes sorghum cultivation:
 - + Food security
 - + Agriculture balancing
 - + Environment protecting.

Exclusive patents of Tin Thanh Group



Treating household waste



Transform solid waste into energy



Treating urban waste



Treating household waste



Solid fuel pellets from waste



Transform solid waste into energy



Technology of transforming solid waste into energy

CLOSED-CIRCULAR AGRO-INDUSTRY

“Closed - Circular Agro-industry” is a full cycle from researching and planting the cultivars, developing energy area to harvesting and making ending products with high economic values from Sorghum. Tin Thanh Group has Research Laboratories cultivars to filter, hybridize and develop types of Sorghum suitable with different areas' conditions.

Tin Thanh has been investing and building complex closed cycle of hi-tech industrial - agricultural complex areas from small and middle sourcing era to factories combined commercial solutions in many key projects. These are the strong basement for Tin Thanh to develop continuously with a much bigger scale in many others project domestically and internationally.

SORGHUM

Sorghum bicolor (L.) Moench is a short-day industrial plant, which can grow disruptively with the lands' conditions in Vietnam. All of the plants' parts after harvesting (including leafs, bodies, seeds, etc.) could be processed to make valuable products as: bioethanol, syrup and calltes' foods. The waste of plants' bodies after being squeezed to create syrups would be used to feed cows or be dried out to become burning materials to create air energy (Air- Electricity).

We succeeded in importing Sorghum from the USA, India, Brasil to hybridize and filter to create new cultivar which can adapt to lands' conditions in Vietnam for many years.

Advantages of new Sorghum Cultivar of Tin Thanh Group

- ▶ Aluminous lands of < 4 - 5 pH degrees.
- ▶ Salty lands of over 3 ‰.
- ▶ Poor condition lands with organic contents to 1%.
- ▶ Stand against the 6-level winds (40-50 km/hour), 8-level gale.

BIOMASS ENERGY

- ▶ Reducing tons of carbon emissions ejected into environment
- ▶ Customers' manufacturing costs saving.
- ▶ Creating thousands of jobs in industry, agriculture and service.

Tin Thanh Group has been researching and successfully developing solutions using biomass fuels as an alternative for fossil fuels. Currently, we are providing middle and high pressured air produced by renewable fuels to enormous factories in Vietnam, ensuring the safety and the stabilities in these factories' operation, creating efficiencies in economic and sustainable production. These are the goals we have been aiming during the development process of Tin Thanh.

Tin Thanh Group is looking forward to become the number 1 producer and exporter in Vietnam for biomass electricity, energy saving tablets and others products of sorghum to enhance its economic values.

One of Tin Thanh Group's Sorghums' advantages:



After a level 6 storm (40-50 km/h), the Sorghums of Tin Thanh Group were seriously damaged on their bodies, were nearly broken half.



2 weeks from exclusive care of Tin Thanh Group, these Sorghums developed disruptively to recover back to normal conditions.

PRODUCTS FROM SORGHUM

Sorghum after harvestment could be made into valuable products providing for Vietnamese market and exporting in Energy, Industrial Production and Agriculture.

Products in Energy field:



Sorghum Pellets



Sorghum bodies wastes materials



Sorghum bodies powders



Input fuels for:



Biomass Electricity factories



Biomass Electricity and Air factories

Products in Industrial Production:



Syrups: Sweetener alternated for chemical sugars



Food alcohol 96% Alc: From Sorghum and Cordyceps



Liquid CO2: Foaming and dry ice

Products in Agriculture



Dried cattles' foods

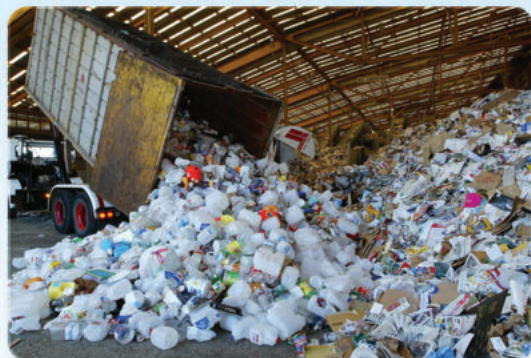


Bio-fertilizers

HOUSEHOLD AND INDUSTRIAL WASTE TREATMENT TECHNOLOGY



Household waste



Industrial waste



Waste processing plant



RDF energy pellets



Biomass power plant



Microbiological organic fertilizer



Sorghum field

Advantages of waste-to-energy and waste-to-fertilizer technologies:

- Closed & Automated System
- Create added value from waste
- Protect the environment

It is estimated that Vietnamese cities generate around 30,000 tons of household waste every day; in which Hanoi and Ho Chi Minh City account for about 40% of total waste. The amount of household waste increases by 7% on average per year. Most of the current urban household waste is treated by landfill disposal. This landfill disposal is causing serious consequences: costing a large amount of land to bury waste and polluting the water.

To solve that problem, Tin Thanh Group has researched and developed technology to process daily waste into energy fuel and fertilizer with the goal of contributing to energy security, agricultural stability and environmental protection.

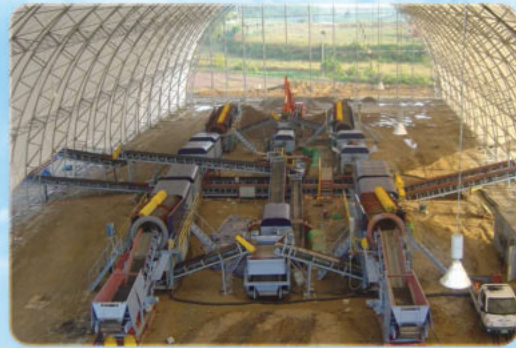
TREATING AND PROCESSING TECHNOLOGY FOR THE PERENNIAL BURIED WASTE

In Vietnam, there are more than 900 landfills. The environmental pollution from these landfills is extremely dangerous.

Tin Thanh Group has researched and developed technology to treat perennial landfill waste into energy fuel and fertilizer with the goal of reducing environmental pollution and creating tremendous economic value from perennial landfill waste.



Landfills area



Burial waste treatment system



Microbiological organic fertilizer



Uncompressed RDF fuel



Compressed RDF fuel



Recycled metal



Sorghum field



Energy-from-waste power plant

Advantages of perennial waste treatment technology:

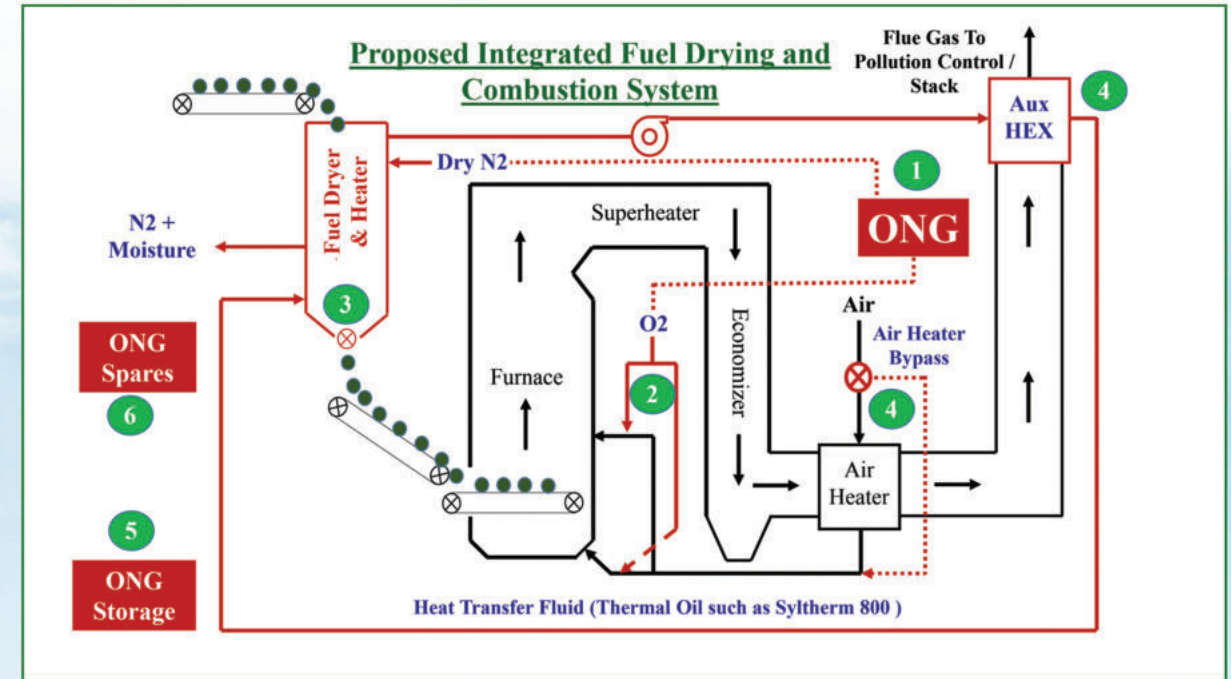
- Create high economic value from perennial landfill waste
- Effectively re-using the perennial landfills area
- Fully mastering technology from TTG - HMC
- Protect the environment and do not generate waste water, exhaust fumes.
- Thoroughly treating pollution sources at landfills area



NATURAL GAS PRODUCTION



Tin Thanh Group cooperates with Air Products - United States to provide leading industrial, food and medical gases in the region. Tin Thanh continuously enhances the quality of products and services to strengthen and maintain its position in the future. With an advanced and modern industrial gas production base, we constantly offer our best services to all customers and to all sectors of the industry such as high quality gases, special gases, mixed gases, piping and customer service.



Further improved performance

Oxygen Enriched Air

- Lower stack flow rate through replacement of combustion air
- Reduction of carbon loss
- Potential for lower CO and NOx emissions
- Reduction in unburned carbon and lowering of excess air ratio with dried fuel

Fuel Drying Optimum Ranges

Optimal range of moisture
- 35 - 40wt %

- Maximize performance gains
- Maximize fouling risk

Air heater Bypass

- Enables drying of fuel with minimal lowering of stack temperature, if that is desired
- Allows for optimal apportioning of flue gas energy recovery between combustion air and fuel drying
- Facilitates independent adjustment of boiler conditions when fuel properties vary

SOLAR ENERGY



Energy from the sun is converted into electrical energy which is known as the cleanest and most abundant renewable energy source; and our country has the plentiful solar resources.

Rooftop solar power is a solution that not only saves costs and protects the environment, but is also considered as an investment and effective energy-saving solution for the society at present.

AGRICULTURE AND SOLAR POWER

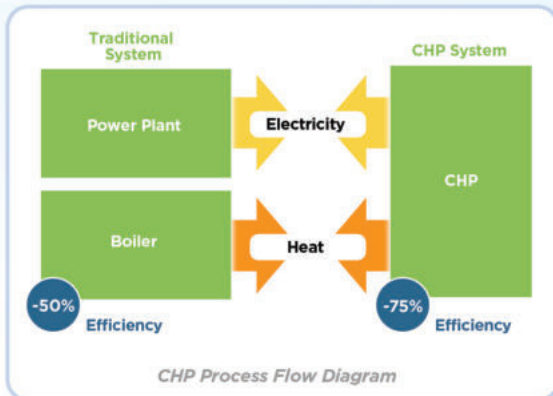


Agricultural production combined with solar energy rooftop solution brings many benefits

The model of agricultural production in combination with solar energy rooftop solution is a circular economic model with zero waste; everything is thoroughly exploited to create a value chain with the above solar power system and below the agricultural export.

This model not only brings high income but also creates great value in harsh lands, adapts to climate change, develops agricultural economy in a sustainable direction.

ELECTRIC AND STEAM COMBINATION



Electric and steam system combined with application for industrial clusters, single factories or factory combination, residential areas, re-sel to the electricity grid ...

- + Supply electricity at low cost.
- + Provide steam at a low cost.
- + Limit power supply interruptions
- + Environmental protection
- + Fast capital recovery

TECHNOLOGY STARTUP

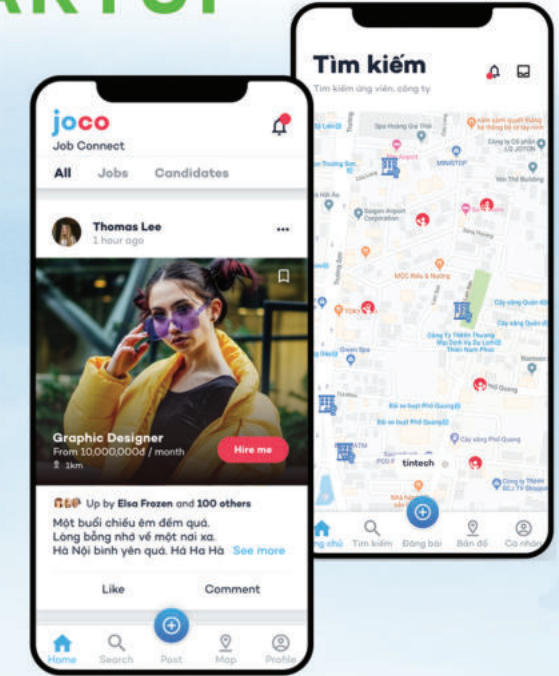
JoCo - The first Career network in Vietnam

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We hope to bring a better life to many people by helping them find jobs with environments and requirements that match their abilities and expectations.



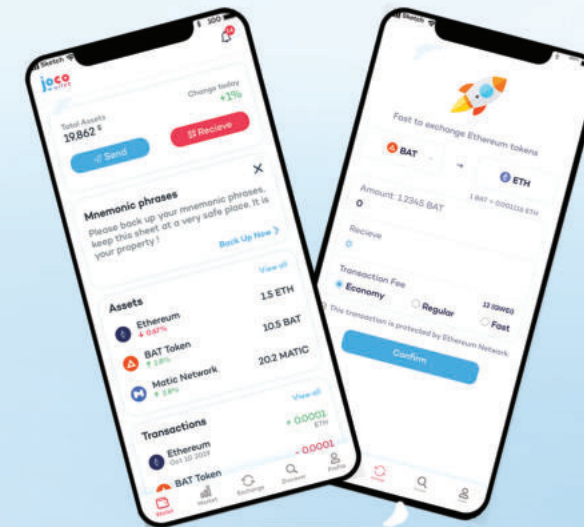
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PARTNERS

After more than 10 years of sustainable development, Tin Thanh Group won great trust from domestical and international customers, partners.



ACTIVITIES AND EVENTS



Participated in Vietnam Business Summit



Tin Thanh promoted Vietnam - the USA trading



Proposing Sorghum cultivation plans to An Giang's Chairman and The People Union



Discussion with the USA vice president Mike Pence and House of Representatives Paul Ryan



Signing cooperation for investment with Phu Yen's government



Vietnam - American promotion cooperation agreement's signing.