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NEWS LETTER

OIL TECHNOLOGISTS' ASSOCIATION OF INDIA WESTERN ZONE

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This news letter is for free circulation only to the members of OTAI-WZ

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OIL TECHNOLOGISTS' ASSOCIATION OF INDIA WESTERN ZONE

From the Editors's Desk

OTAI at cross-roads? Decades before OTAI was formed with the sole idea of a gigantic progress in agri production of oilseeds, processing technological revolution, feed the millions of Indians with nutritional intakes of oils and fats. Despite a strong effort, not much progress was made. Technology Mission was an object failure. OTAI expressed only lip-sympathy. Our population grew to a billion, Alas! our oil productionstagnated. So, we resorted to import of veg oils. It grew to massive proportions. Today, we import four million tonnes of vegetable oil. Otains watched the debacle helplessly. Frustrated. And now we chose the track towards sophisticated elitist products. For the pseudo-richly rich. It is Soaps, Detergents, Toiletries. Oil Mills, Extraction Plants, Refineries have all become redundant. The former brings in lot of moolah. The latter? only consolations. We need to fix our goals (what route) should we follow? Ponder over this, Food and Nutrition require our first attention. Any ideas on this?

  

SAGE ADVICE
TEN GUIDING PRINCIPLES OF STAYING AFLOAT IN A CHANGING WORLD

Azim Premji

at *IIM Ahmedabad Convocation, Tuesday, July, 2010*

We must remember that many have contributed to our success, including our parents and others from our society

WHILE change and uncertainty have always been a part of life, what has been shocking over the last year has been both the quantum and suddenness of change.

For many people who were cruising along on placid waters, the wind was knocked out of their sails.

The entire logic of doing business was turned on its head. Not only business, but also every aspect of human life has been impacted by the change. What lies ahead is even more dynamic and uncertain I would like to use this opportunity to share with you some of our own guiding principles of staying afloat in a changing world. This is based on our experience in Wipro. Hope you find them useful.

First, be alert for the first signs of change. Change descends on every one equally, it is just that some realize it faster. Some changes are sudden but many others are gradual. While sudden changes get attention because they are dramatic, it is the gradual changes that are ignored till it is too late. You must have all heard of story of the frog in boiling water. If the Temperature of the water is suddenly increased, the frog realizes it and jumps out of the water. But if the temperature is very slowly increased, one degree at a time, the frog does not realize it till it boils to death. You must develop your own early warning system, which warns you of changes and calls your attention to it. In the case of change, being forewarned is being forearmed.

Second, anticipate change even when things are going right. Most people wait for something to go wrong before they think of change. It is like going to the doctor for a check up only when you are seriously sick or thinking of maintaining your vehicle only when it breaks down. The biggest enemy of future success is past success. When you succeed, you feel that you must be doing something right for it to happen. But when the parameters for success changes, doing the same things may or may not continue to lead to success. Guard against complacency all the time. Complacency makes you blind to the early signals from the environment that something is going wrong.

Third, always look at the opportunities that change represents. Managing change has a lot to go with our own attitude towards it. It is proverbial half-full or half-empty glass approach. For every problem that change represents, there is an opportunity lurking in disguise somewhere. It is up to you to spot it before someone else does.

Fourth, do not allow routines to become chains. For many of us the routine we have got accustomed to obstruct change. Routines represent our own zones of comfort. There is a sense of predictability about them. They have structured our time and even our thought in a certain way. While routines are useful, do not let them enslave you. Deliberately break out of them from time to time.

Fifth, realize that fear of the unknown is natural. With change comes a feeling of insecurity. Many people believe that brave people are not afflicted by this malady. The truth is different. Every one feels the fear of unknown. Courage is not the absence of fear but the ability to manage fear without getting paralyzed. Feel the fear, but move on regardless.

Sixth, keep renewing yourself. This prepares you to anticipate change and be ready for it when it comes. Constantly ask yourself what new skills and competencies will be needed. Begin working on them before it becomes necessary and you will have a natural advantage. The greatest benefit of your education lies not only in wnat you have learnt, but also in working how to learn. Formal education is the beginning of the journey of learning. Yet I do meet youngsters who feel that they have already learnt all there is to learn. You have to constantly learn about people and how to interact effectively with them. In the wond of tomorrow, only those individuals and organisations will succeed who have mastered the art of rapid and ongoing learning.

Seventh, surround yourself with peoole who are open to change. If you are always in the company of cynics, you will soon find yourself becoming like them. A cynic knows all the reasons why something cannot be done. Instead, spend time with people who have a "can-do" approach. Choose your advisors and mentors correctly. Pessimism is contagious, but then so is enthusiasm. In fact, reasonable optimism can be an amazing force multiplier.

Eighth, play to win. I have said this many times in the past. Playing to win is not the same as cutting corners. When you play to win, you stretch yourself to your maximum and use all your potential. It also helps you to concentrate your energy on what you can influence instead of getting bogged down with the worry of what you cannot change. Do your best and leave the rest.

Ninth, respect yourself. The world will reward you on your successes. Success requires no explanation and failure permits none. But you need to respect yourself enough so that your self-confidence remains intact whether you succeed or fail. If you succeed 90 percent of the time, you are doing fine if you are succeeding all the time, you should ask yourself if you are taking enough risks. If you do not take enough risks, you may also be losing out on many opportunities. Think throuqh but take the plunge. If some things do go wrong, learn from them. I came across this interesting story some time ago:

One day a farmer's donkey fell down into a well. The animal cried piteously for hours as the farmer tried to figure out what to do. Finally he decided the animal was old and the well needed to be covered up anyway, it just wasnt worth it to retrieve the donkey. He invited all his neighbors to come over and help him. They all grabbed a shovel and begin to shovel dirt into the well. At first, the donkey realised what was happening and cried horribly. Then, to everyone's amazement he quieted down. A few shovel loads later, the farmer finally looked down the well and was astonished at what he saw. With every shovel of dirt that fell on his back, the donkey was doing some thing amazing. He would shake it off and take a step up. As the farmer's neighbors continued to shovel dirt on top of the animal, he would shake it off and take a step up. Pretty soon, everyone was amazed as the donkey stepped up over the edge of the well and totted off! Life is going to shovel dirt on you, all kinds of dirt. The trick is to not to get bogged down by it. We can get out of the deepest wells by not stopping. And by never giving up! Shake it off and take a step up.

Tenth, In spite of all the change around you, decide upon what you will never change - your core values. Take your time to decide what they are but once you do, do not compromise on them for any reason. Integrity is one such value.

Finally, we must remember that succeeding in a changing world is beyond just surviving. It is our responsibility to create and contribute something to the world that has given us so much.

We must remember that many have contributed to our success, including our parents and others from our society. All of us have a responsibility to utilise our potential for making our nation a better place for others who may not be as well endowed as us, or as fortunate in having the opportunities that we have got.

Let us do our bit, because doing one good deed can have multiple benefits not only for us but also for many others. Let me end my talk with a small story I came across some time back, which illustrates this very well.

This is a story of a poor Scottish farmer whose name was Fleming. One day, while trying to matte a living for his family, he heard a cry for help com-

ing from a nearby bog. He dropped his tools and ran to the bog. There, mired to his waist in black muck, was a terrified boy, screaming and struggling to free himself. Farmer Fleming saved the boy from what could have been a slow and terrifying death. The next day a fancy carriage pulled up to the Scotsman's sparse surroundings. An elegantly dressed nobleman stepped out and introduced himself as the father of the boy farmer Fleming had saved. "I want to repay you, "said the nobleman.

'Yes.' the farmer replied proudly. "I'll make you a deal. Let me take your son and give him a good education. If he's anything like his father, he'll grow to be a man you can be proud of." And that he did. In time, Farmer Fleming's son graduated from St. Marys Hosoital Medical School in London, and went on to become known throughout the world as the noted Sir Alexander Fleming, the discoverer of Penicillin Years afterward. The nobleman's son was stricken with pneumonia. What saved him? Penicillin. This is not the end.

The nobleman's son also made a great contribution to society. For the nobleman was none other than Lord Randolph Churchill and his son's name was Winston Churchill.

Let us use all our talent, competence and energy for creating peace and happiness for the world.

Mr. Azim H Premji started his career with edible oil processing and is founder member and signatory to the Memorandum ana Articles of Association of The Solvent Extractors' Association of India.

(Courtesy : SEANEWS CIRCULAR, VOL:XIII, Issue 5, August 2010)

"RICHIE RICH"

India has more rich people than poor now; NCAER

FOR the first time ever, the number of high-income households in India has exceeded the number of low-income, the National Council of Applied Economic Research (NCAER) has estimated. The NCAER estimated that despite the economic slowdown of the last three years, the number of high-income households should have reached 46.7 million by March 2010, exceeding the 41 million households counted as low-incomes.

If true, this would be a remarkable turnaround just within a decade. It started with just 13.8 million households described as high-income, or earning more than Rs 1.8 lakh per annum at 2001-02 prices. Meanwhile, 65.2 million households were classified as low-income or earning less than Rs 45,000 per year.

The NCAER estimated that middle-income household, or those earning between Rs 45,000 and Rs 1.8 lakh per annum, raised sharply from 109.2 million to 140.7 million in the decade.

NCAER, in the report also estimated the number of families having income between Rs 2 lakh and Rs 10 lakh per annum at 284 million by 2009-10 which is close to the World Bank definition of middle class, the number of such middle-class households was 4.5 million in 1995-96 and 10.7 million in 2001-02. The report said that two-thirds of the Indian middle class is to be found in urban India and that trend has continued in the last 15 years also. India has one of the highest savings rates in the world, with savings constituting an estimated 36 percent of the GDP.

"JAI MAHARASHTRA"

Maharashtra Looks To Bumper Harvest

THE rain gods have been very kind to Maharashtra. In the last two months, out of the 35 districts, 29 have received over 100 per cent rainfall. Farmers across the State have completed khanf planting.

The Agriculture Secretary, Mr Nanasaheb Patil, told Business Line that with good rams across the State and even in drought-prone areas of Mara'hwada and Vidahrbha. there will be bumper harvest for the farmers, "Crop planting across the State is almost 100 per cent complete," he said.

According to a State Government's note on the

status of monsoon and crops, the rainfall in June was 218 mm, 98 per cent of the normal rainfall. In July, it was 506 mm, 29 per cent higher than normal. During June-July, the State received 724 mm of rainfall, 18 per cent higher than normal rainfall.

Khanf crops are usually planted over 132 34 lakh hectares (in) and this year until August 9, about 145 3 Ih have been brought under various crops. In some areas of Konkan, green shoots have already started appearing in rice fields, while crops of green gram (noong) and black gram (urad) are flowering. Growth of soyabean, cotton and sorghum is also satisfactory, the note said Cultivated area under major crops like pigeon pea (tur) and cotton has increased The pigeon pea area which was about 11.16 Ih last year has increased To 1360 Ih. In 2009. cotton was spread over 35.03 Ih while this year it has been planted over 39 50 Ih. The area under pulses has increased six percent to 25.9 Ih, while coverage of cereals is lower by 19 per cent at 40.6 Ih But their sowing is l.kely to continue for another month or so. The acreage under sugarcane has increased 33 per cent to 9.45 Ih. *(Source : The Hindu Business Line dated 12th Aug'10).*

(Courtesy : SEANEWS CIRCULAR, VOL:XIII, Issue 5, August 2010)

NEW INITIATIVES

Minister of State in the Ministry of Agriculture and Minister of State in the Ministry of Consumer Affairs, Food and Public Distribution

Prof K V. Thomas

(a) & (b) The Centrally Sponsored Scheme of National Food Security Mission (NFSM) was launched during Rabi. 2007-08 witn an aim of increasing the production by 10 million tonnes of rice, 8 million tonnes of wheat and 2 million tonnes of pulses by the end of Eleventh Five Year Plan (2011-12). The Scheme covers rice, wheat and pulses only. Oilseed is not covered under the NFSM.

The focus and target oriented technological intervention under NSFM has made a significant impact since inception which is reflected by the fact that during the year 2006-07, the food grain production was recorded at 217.28 million tonnes which increased to 234.47 million tonnes during 2008-09 showing an increase of 17.19 million tonnes over the production of 2006-07 i.e. prior to inception of the NFSM scheme. As per the 4th advance estimate of 2009-10, the production of foodgrain is estimated as 218.20 million tonnes. This reduction in food grain production during 2009-10 is due to widespread drought that prevailed in most parts of the country during Kharif 2009.

As regards Oilseeds, the total production was 242 89 lakh tonnes during 2006-07 and had shown increasing trend i.e. 297 55 lakh tonnes during 2007-08 which as per 4th Advance Estimate was showing a declining trend to a level of 249 28 lakh tonnes mainly on account of severe d-ougnt in 2009-10.

(Courtesy : SEANEWS CIRCULAR, VOL:XIII, Issue 5, August 2010)

"IMPRESSIVE"

Oilseeds Production and Imports of Vegetable Oils

Last week, the Government of India announced 3rd Advance Estimate of production of majorcrops including Oilseeds grown in the country during 2009-10 and estimated oilseeds production at 25.41 million tonnes while trade estimate is 23.11 million tonnes. The main difference is in soybean production. The Government has estimated soybean production at 10.5 million tonnes while trade estimate is 8.5 million tonnes.

Imports of Vegetable Oils during first half of the year show that import is more or less same as the last year and reported at 42.90 lakh tonnes against last year's 42.92 lakh tonnes. The import is likely to increase in tho second half of the year as we are entering into lean crushing period. It is ironical that about 145 lakh tonnes of oilseeds are still available for crushing apart from unprocessed rice bran in paddy form. If no corrective steps are taken to encourage the processing of local seeds through policy measures, including a reasonable levy of import duty on vegetable oils and increase

in tariff rate to align with the current market rate, then carry forward stocks may reach alarming levels by the end of current season, which may discourage sowing in the ensuing kharif season and may have downward pressure on the price at the time of harvesting too and would discourage the farmers to grow oilseeds. It is sad that the domestic oil carries duty burden of about 10% by way of VAT, Octroi, Mandi tax etc. while imported crude oil is being imported at 'zero' per cent duty. There is an urgent need to have level playing field between domestic & imported oil by imposing a reasonable import duty on vegetable oils to stimulate the processing of local oilseeds which can put considerable downward pressure on domestic prices of oilmeals as well as oils.

(Courtesy : SEANEWS CIRCULAR, VOL:XIII, Issue 2, May2010)

"STILL DEPENDENT"

Half Yearly Import of Vegetable Oils - Stagnant April 2010 import down by 22%

THE import of vegetable oils during April 2010 is reported at 543,252 tons, compared to 699,396 tons in April, 2009, consisting of 504,410 tons of edible oils and 38,842 tons of non-edible oils i.e. down by 22%. The overall import of vegetable oils during Nov'09 to Apr'10 is reported at 4,290,673 tons more or less same of the last year at 4,292,088 tons.

The import of vegetable oil during 1st quarter (Nov.'09 - Jan.'10) was reported at 2,413,784 tons compared to 2.189.007 tons i.e. up by 10%. However, in 2nd quarter (Feb.'10 -Apr'10) the import of vegetable oils reduced to 1.876,889 tons compared to 2,103,081 tons i.e. down by 11% due to larger stock at the ports and pipe lines.

Although, the import has slowed down in 2nd quarter, the overall import in 1st half of the current year is more or less the same of last year.

Current stock of edible oils as on 1st May,2010 at various ports estimated at 575,000 tons (CPO 355.000 tons, RBD Palmolein 90,000 tons, Soybean oil 65.000 tons and Sunflowerseed oil 65,000 tons) and about 650,000 tons in pipe lines. Total stock as on 1st May, 2010 is 1,225.000 tons nearly one month requirement of the country.

Also about 145 lakh tons of oilseeds still available for crushing apart from unprocessed rice bran. If processing of local seeds is not encour-

Import of Vegetable Oil (Edible & Non-edible) Nov. '09 To Apr'10

(Qty. in M T.)

Month	2009-10			2008-09			% Change
	Edible	Non-edible	Total	Edible	Non-edible	Total	
Nov., 09	712,677	41,289	753,966	519.032	36.310	555,342	+ 36%
Dec.'09	761,835	25,588	787,423	719,125	26,438	745.563	+ 6%
Jan.'10	827,182	45,213	872.395	856,690	31,412	888.102	- 2%
1st Quarter	**2,301,694**	**112,090**	**J.41 3,784**	**2,094,847**	**94,160**	**2,189,007**	**+ 10%**
Feb. '10	671,293	29.476	700,769	730.094	32,450	762.544	- 8%
Mar'10	612,293	20,575	632,868	609.553	31,588	641.141	- 1%
Apr.1 10	504,410	38,842	543.252	659,477	39.919	699.396	- 22%
2nd Quarter	**1,787,996**	**88,893**	**1,876,889**	**1,999,124**	**103,957**	**2,103,081**	**-11%**
Total	**4,089,690**	**200,983**	**1,290,673**	**4,093,971**	**198,117**	**4,292,088**	**+ 0.03%**

aged through policy measures, including levy of import duty on vegetable oil or an increase in base rate (unchanged for four years), carry forward stocks may reach alarming levels by the end p^,the current season, which may discourage sowing the ensuing kharif season.

(Courtesy : SEANEWS CIRCULAR, VOL:XIII, Issue 2, May2010)

"STILL LIMPING"

Oilseeds Production Projected Lower At 25.40 Million Tonnes

FOODGRAIN output seen lower; record wheat crop estimated . : The Agriculture Ministry has projected a record wheat crop of 80.98 million tonnes (mt) this crop year ending June. According to the Ministry's estimates, foodgrain production in this crop year will be lower at 218.19 mt against 234.47 mt, due mainly to the kharif crop being hit by a prolonged dry period. Cereals production has been estimated at 219.90 mt (203.42 mt). With rabi production being better (14.53 mt vs 14.27 mt), rice output this year is seen at 89.31 mt against a record 99.18 mt last year. Coarse cereals are projected to drop to 23.20 mt against 28.54 mt a year ago.

Pulses - a record production of gram (chickpea) at 7.38 mt against 7.06 mt a year ago. Tur (2.56 mt v 2.27 mt) and urad (1.29 mt vs 1.17 mt) also showed an improvement but moong dropped to 0.73 mt (1.04 mt).

Oilseeds production has been projected lower by 2.3 mt at 25.40 mt. Soyabean output is estimated at 10.54 mt, the highest after 10.98 mt produced in 2007-08. The production of castorseed (1 mt vs 1.13mt), sesamum (0.61 mt v 0.75 mt) and mustard (6.59 mt v 7.20 mt) all declined.

Cotton production has been projected at 254.07 lakh bales (of 170 kg) against 277.19 lakh bales this year. Sugarcane production is seen lower at 274.65 million tonnes against 285 million tonnes a year ago. *(Source : The Hindu Business Line dated 13th May'10).*

(Courtesy : SEANEWS CIRCULAR, VOL:XIII, Issue 2, May2010)

"FOR STARVING MILLIONS"

Vegetable oil imports at record high in August

INDIA'S import of vegetable oils crossed a record 1 million tonne in August as stockists and processors purchased heavily to meet the increased demand ahead of festival season.

According to the latest data from the Solvent Extractors' Association of India (SEAI), import of 1.06 million tonne of vegetable in August 2010 mainly consisting of edible oil is the highest in a single month since the government allowed import of crude vegetable oil for meeting the domestic demand in 1994.

In India, edible oil demand usually jumps ahead of festivals and marriage as consumption of fried eatables rises.

SEA said India imported around 64,000 tonne of non-edible oil in August which is an increase of 64% compared to same month last year About 1.3 lakh tonne of RBD palmotein, 5.4 lakh tonne of crude palm oil and 2.1 lakh tonne of soyabean oil were imported during the month. SEA said around 6.8 lakh tonne of edible oil stock was at ports and about 7 lakh tonne were in the pipeline at the start of this month.

In August, 2009, edible oil imports stood at 6.12 lakh tonne, while non-edible oil shipments amounted to 37,705 tonne, the industry body said.

India imports palm oils from Indonesia and Malaysia, while soyaoil and sunflower oil are sourced from Argentina and Brazil. India, the second-biggest vegetable oil consumer after China, had imported a record 8.6 million tonne of vegetable oil in the 2008-09 oil year.

FE recently reported that the retail prices of edible oil in the domestic market are expected to stable during next six months despite demand rising.

"We have enough stocks of crude edible oil (mostly palm and soyabean) at ports and pipelines for dealing with the rise in demand during

coming festival season," Siraj Chaudhry, CEO of refined oils, Cargtll India, had said.

An FE analysis showed that retail prices of refined soybean oil have been in the range of Rs 49 to Rs 55 a litre during last one year "Although the global crude edible oil prices have moved up marginally by about 7% during last few months, but there is no cause of concern for the next few months," Chaudhry had said. *(The Financial Express 15th September, 2010).*

(Courtesy : AICOSCA Newsletter, July, August,2010).

IRRATIONAL

Middle East set to become global hub

WITH its advantaged feedstocks and actress to growth markets, the Middle Mast will become the petrochemical sector's core. I3ut there are opportunities for success elsewhere.

GLYN JOHNSON KLINE

We have a habit in the chemical world of seasoning all we write with \ni'/.y. words - many of which overlap to a I»ewildering extent. So let's try I" clarif\ what a huh is.

In the literal sense, the hub carries the bearings around that smoothly circulate to turn the wheel and support the weight of the entire vehicle at its contact with the axle. In the chemical world, there is a great deal of confusion about where, a hub stops and everything else within the value chain starts.

A few years ago, individual sites might have been considered to be hubs. Wilton, in the northeast of the UK, was once considered exactly that, with its bearing being the leader-style steam cracker from which material spokes extended into products such as glycols, polyolefins and polyesters. Beyond this was the wheel rim of the process segment of the petrochemical value chain. However, rationalization of the petrochemical sector in the 1990's saw many of the material spokes pass into new ownership. This made them subject to further rationalisation and, in some cases, to closure.

To say the least, in spite of the quality of the central assets, this rendered the wheel somewhat shaky, and this position is being rebuilt by the current owners of the cracker to maintain its economic viability. The shakiness of the original model was only exacerbated by the collapse of many of the local region's keystone, industries - a difficult situation, both economical and socially. Bodies such as the North East Process Industry fluster are making stern efforts to address this, using the historical, industrial and technical skills base that exists in the Wilton area.

In a way. this is a reverse of what happened at BASF Ludwigshafen, in Germany Wilton, which under the original ICI governance was an English "Verbund" (integrated) concept, with each part integrated to and mutually reliant upon the others. For BASF Ludwigshafen is a hub in itself and acts as such for the heartland of German industry that utilizes its out put. However, the last recession changed the stability of this concept and shook the foundations of North European petrochemical strategy.

BASF ACTS FAST ON DOWNTURN

BASF's own response to the downturn in 2008 was crucial, immediate and effective - but represented a considerable degree of pain for the company and the Verbund principal. Turndowns and closures, leading to operating rate penalties upstream was clearly a situation that the decades of Verbund development had not previously suffered and management should be praised for its "step-out" in thinking.

Recent years have begun to see a shift in what is considered a hub. away from operations and production sites, towards feedstock advantage and logistics provision. Within Europe we have little to speak of in terms of feedstock advantage (if considered in terms of feedstock into petrochemicals - with the exception of gas from the North Sea fields) when compared with, for example, the Middle East, Russia or even Canada. Our modern-day hubs are ports such as Rotterdam or Antwerp, which have land, at cess, terminal facilities, storage facilities arid a cuticenlra-tion of all these and more tools that make them cost-effective places to invest in petrochemical production.

Extensions of this are the wheel spokes of the infrastructure in Europe. in particular the ARG pipeline network that links the port hubs with landlocked sites. This loo can lead to hubs of a different sort where landlocked sites integrate with each other and the ARG to provide provincial hubs - an example being the Chemsite network in Northern Germany.

However, all of these more recent considerations of the nature of a petrochemical hub in Europe have a fundamental downside - the regional competitiveness of Europe versus other regions and the polarization of international trade post-recession.

NEW PARADIGM FOR PRICING

Go back 20 years, and the price-setting mechanisms for globally traded bulk petrochemicals and polymers would be found in the economics of the US Gulf coast marginal exporter, trading with East Asia. Now all that has changed. Now, it would be best to look at the cost base of the Gulf Cooperation Council producers, the logistics costs to China and China's trade in finished or semifinished goods with the rest of the world, and its own internal economic competitiveness. The trade in chemicals and global commodity pricing mechanisms are now polarized along an axis between the Middle East adn East Asia (particularly China). This brings us to the issue of modes of global recovery, post-recession. We are in what Kline terms a realignment (or Trade Bloc) scenario. The change of administration in the US has taken a strong line on its role in global trade - as Larry Summers, head of government advisory body the National Economic Council, put it in his interview with UK newspaper the Financial Times in July 2009 - the "world can no longer regard the USA as the consumer of last resort." However, what the institutional target of reduction of US trade with China's GDP growth. China simply looked to its own internal demand requirement and continued buying materials from the Middle East in a pretty much unabated fashion.

The end result of all this is fairly reflected in the statement made by Margaret Walker. US-based chemical producer Dow's global vice president of engineering solutions, technolgy centers and manufacturing and engineering work processes. Speaking recently in Bahrain, she described the Middle East as becoming "the foremost global petrochemical hub." It is a logical conclusion and the end-game - if push comes to shove - is that the Middle East will be the last man standing based solely on feedstock cost advantage.

So we are down to a situation where the ultimate hub is where the chfM|>est feedslo< k is, assisted by sound logistics and access to markets - the regional hub serving the other regions. How many of these can we have?

WHO WILL THE WINNERS BE?

Eventually of course the answer is "one winner." but, in the meantime, what opportunities are there? Jumping from one global crunch point to another - recession to "end of oil" -there are some regions that may have scope to make a major play.

The previouslv mentioned Russia has major reserves, but even within its own territory the access to market can be challenging. The major fields are in the East and the demand in the West, with an awful lot of territory in between.

Russia's industry has two clear commodity-choices: transport the feedstock to the West of Russia and build derivative positions of a scale linked to the market, or become a hub for the East, with lead scale derivatives on top of the gas fields, to serve the markets of Asia Logistics will be the sticking point here - in either case.

As oil reserves dwindle and demand continues, we are looking to a cost curve in terms of the extraction of oil that drives us up towards a reliance on alternative sources -hence the earlier reference to Canada. As our continuing demand for oil looks set to remain above 100m bbls/day of oil equivalent, oil sands and oil shales sit at the point where they become economically viable as a source of transport fuels and petrochemical feedstock.

If Kline's innovation mode becomes the favored economic scenario, expect these and other alternatives to give the potential for new regional hubs. But if the environmental mode holds sway, there may be problems associated with local opposition to the extension of these deposits into a fully grown petrochemical hub.

In the end, the scope to be the global hub still rests with the Middle East. But the changing dynamic of what is and is not an economically viable, feedstock position give new regional opportunities for some.

(Courtesy : ICIS Chemical Business, August 9-15, 2010).

BETTER THIS WAY

Finance Forward

THE new Order-to-Cash process also will assist in maintaining cash flow - a critical benefit, particularly in the current economic environment.

Finance Forward is not just about accounting; this new financial management system will deliver valuable transparency and control across the Company, taking Stolt-Nielsen into the 21st century and well into the future.

The design phase of Finance Forward. SNSA's global implementation of Oracle's e-Business Suite and Hyperion Financial Management solutions, is now complete and the project has entered the build phase.

Launched in the summer of 2009. Finance Forward is a two year undertaking, which will result in the implementation of a state of the art financial management and enterprise resource planning (ERP) capability that will substantially improve SNSA's ability to manage its business. The new Oracle solutions will supersede the Company's existing J.D. Edwards accounting system.

"It's difficult to overstate the importance of this project and the very significant benefits that it will bring to SNSA and its operating units." said Jan Engelhardtsen. SNSA's Chief Financial Officer and Chairman of the Finance Forward Steering Committee "When you look at the Company today - at least from a financial management perspective our divisions are essentially working autonomously, using variations of the same applications, many of them paper based.

"The new ERP system will harmonise and computerise key critical processes across all of our operating units This will allow us not only to operate more efficiently and more intelligently, but also to obtain better information and insights about our operations faster. On top of that, we will significantly lower our costs going forward."

Enthusiasm for the new systems is shared by those in the operating units who have a clear picture of what is to come. Machteld van Dijk-Wuyts, Controller for Stolthaven Terminals, said "I'm extremely excited about this because I know from experience what ERP systems can do. Yes, this is going to be a big change for our people. But once they see the benefits - the transparency that it provides to operations, the data that will be available and the insights from the analytical tools - I think people will be thrilled."

Van Dijk Wuyts. who serves on the Finance Forward core project team, added "We tend to talk about this as if it is a financial management tool, but it is really much more than that. In terminals, for example, this will improve our entire procurement process and provide support to our people on the collections side of the business. This is not just about accounting."

In the broadest sense, the Finance Forward project focuses on four critical business processes.

The **Order-to-Cash** process involves everything that takes place between the receipt of an order from a customer to the time that payment is received, or perhaps a collection is made. A clear window to the Order-to-Cash process provides a complete and up to date view of all of the Company's customer relationships. Being able to access such information can be extremely valuable, the system instantly shows where the Company stands with any customer. The new Order-to-Cash process also will assist in maintaining cash flow - a critical benefit, particularly in the current economic environment By automatically flagging accounts to the collections staff as soon as they are past due, the new system will support a more efficient and timely collections process.

The Procure-to-Pay process - like Order-to Cash - captures all the steps that take place be-

tween the time that goods or a service are ordered by the Company and the time that the invoice for the goods or service is paid.

One benefit of the new system is that it will use a single "address book" for all of SNSA's suppliers across all divisions This feature will allow the performance of different vendors to be easily compared, while also enabling the Company to capitalise on volume discounts by providing transparency to total purchases company-wide. While the Company's current procurement process is predominantly paper based, the process will transition to a fully electronic environment in the new system.

The **Invest-to-Capital** process focuses on the activities surrounding the creation or acquisition of assets and the subsequent depreciation of those assets. To put it another way, let's suppose Stolthaven is building a new terminal for $400 million. The insights generated by the Invest-to-Capital process enable Stolthaven to steer the project better by staying on top of budget, costs and even taxes. Such intelligence helps management to see and avoid potential problems, such as cost overruns. At present, the Company does not have an advanced project-management capability.

Record-to-Report is the fourth key business process - what might be called "financial truth serum". By gathering all of the Company's financial and transactional data into a single general ledger. Record to Report can deliver the financial results in a matter of minutes. When corporate finance needs a snapshot of SNSA's financial situation. Record-to-Report will provide it. Record to Report will substantially reduce the time needed to close the Company's books each quarter for reporting purposes, while eliminating many of the slow, manual processes now associated with that process.

"What we are really talking about here is control - giving both corporate and the divisions greater transparency into the businesses and using that visibility to detect and avoid problems." said Homiyar Wykes. Group Financial Controller. "We need to be able to see things before they occur, so that we don't find ourselves saying. 'Hey. we're over budget here' How did that happen?".

The information technology being deployed in support of the project is equally critical. "From a systems point of view, the tight integration and interfacing needed to make this project work is our primary focus," said Peter Koenders. SNSA's Chief Information Officer "We are utilising the latest technologies to build a platform that will deliver fully integrated end to end views of SNSA's businesses on a timely, global basis - which is very powerful. We are also taking care to ensure that this platform is fully scalable and expandable, and provides a strong foundation on which we can build".

The first to go live with the new system will be Stolthaven Terminals and SNSA Corporate Finance & Treasury, with a targeted date of December 1, 2010 Stolt Nielsen Ship Owning, Tanker Trading and Stolt Tank Containers will come next. The project is expected to be completed, including initial support, by September 2011.

The core project team, led by Jan Engelhardtsen, consists of Machteld van Dijk-Wuyts; Judy Hendy, Regional Controller Houston, Matthew Dale, Manager Corporate Reporting; and Peter Pastoor, Global Manager BT Business Applications. With the completion of the design phase and the commencement of the build phase, three new- members have joined the team: Donna York, Controller STC; Jacqueline Buuron, Controller SNSO and Albert van Selm, Accounting Manager Tanker Trading. In addition, a team from Deloilte Consulting, led by Eric Vennix, has served as implementation partner Tata Consulting Serices have provided technical implementation services.

"In joining the Finance Forward team, the core and extended members have literally taken on second jobs." said Egelhardtsen "Their extraordinary dedication to this important project will be reflected. I am confident to say, in an integrated state of the-art financial management system that will bring Stolt-Nielsen into the 21st century and well into the future".

(Courtesy : Stolten, August 2010)

Technology

ACHIEVEMENT

India set for record in area under cotton

INDIA is set for a world record in the maximum area under cotton cultivation this year, with the area estimated toe touch 110 lakh hectares more than one third of the world's total cotton area.

The maximum cotton area ever recorded by any country was 104 takh hectares in the US in 1934. India had come closest to it last year (2009-10), when it registered 101.71 lakh hectares. The jump this year of about 8 hectares will mainly be from Maharashtra, which is always in the news for farmers' suicides in its cotton belt. The Vidarbha cotton areas has gone up by about two lakh hectares this season, with about 1.2 lakh hectares up in the suicide belt of Amravati division and another 80000/- hectares in the Nagpur division. "Another one lakh hectares might go up there," Anupam Barik, director, Cotton Development, India. Maharashtra, which had 32.5 lakh hectares under cotton cultivation in 2009-10 may touch 40 lakh hectares in 2010-11, according to initial estimates drawn by the Cotton Advisory Board in its last meeting. The board will decide on a final figure at its last meeting on July 31. "Maharashtra has already sown it in 35 lakh hectares. It is set to go up to 38-40 lakh hectares if the trend continues. Andhra Pradesh and Gujarat, where the area is likely to go up by eight lakh hectares will also contribute to the overall increase. But it also depends on how it rains over the next 15 days." Barik said.

While the increase in Vidarbha is mainly owing to repeated crises of diseases and low prices in the past two year for soyabean, the overall increase is attributed largely to the success story of Bt. Cotton. "Bt. Cotton has certainly lent confidence to farmers, leading to an increase in production and drop in pesticide consumption by half, but the success is also due to introduction of effective insecticides like gaucho, spinosad and indoxacarb. Integrated Pest and Resistance Management programmes were also introduced around the same time when Bt came. Moreover, some good hybrids were also introduced.

All these had a combined effect for the good," says Keshav Kranthi, Director of Central Institute for Cotton Research here. "Of course, cotton support price hike was also a reason." Barik also gave credit to the good price of cotton.

The cotton area in the country in 2002, the year when Bt cotton was introduced, was about 76.67 lakh hectares. It has shot up by about 30 lakh hectares over the years. The growth has run concurrent to an increase in Bt. Cotton area, which is over 90 percent of the areas under cotton cultivation in the country now. In fact, the area had jumped by about seven lakh hectares from 2008-09 to 2009-10. The over all production in the country has also gone up from 136 lakh bales in 2002-03 to 292 lakh in 2009-10. The peak, however, was 304 lakh bales in 2007 - 08, when the area was 94 lakh hectares.

The contrasting drop in production despite an increase in area was attributed to factors like erratic rains, diseases like reddening of leaves, milibug, leaf-curl virus and other such miscellaneous insect bugs, says Kranthi.

Maharashtra's overall production was about 26 lakh bales in 2002-03 which touched a record 67 lakh bales in 2009-10. The corresponding area growth, however, was by just four lakh hectares from 28 lakh hectares to 32 lakh hectares.

China, however, continues to be the world leader in cotton production, with an output of about 330 lakh bales from just 63 takh hectares. America is third, with about 180 lakh bales from its 39 lakh bales. (The Indian Express 23th July, 2010).

(Courtesy : AICOSCA Newsletter, July-August, 2010).

WATCH OUT FATTY ACIDS

Databank Americas chemical profile

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USES

Fatty acids are largely used in cosmetics and toiletries such as shampoos, liquid detergents. fabric softeners and body lotions. They are also used as lubricants and plasticisers in rubber and polymer processing

SUPPLY/DEMAND

In recent years, global fatty acid demand has increased as a result of end-use consumption growth, as well as strong growth of oleochemicals (fatty acids, fatty alcohol, glycerin).

Demand from US biodiesel producers has been squeezing supplies ot fats and greases. In comparison to tallow-based fatty acid producers, which rely heavily on bleachable fancy tallow (BFT) as a main feedstock for the production of acids and certain soaps, biodiescl producers can use a variety of fats and greases. Buyers of certain products, such as yellow grease and BFT, are scrambling to source sufficient and timely volumes.

PRICE

C18 tallow-based triple-pressed stearic acid (TPSA) prices were unchanged during the week ended August 19. Traders considered the contract range to be high in view of BFT July prices, but agreed tallow values rising into the low-30 cent/lb range were congruent with the spread, according to global market intelligence service ICIS pricing.

Rubber grade prices in a 48-51 cent/lb spread were also said to be representative for current business. Several fatty acid producers were said to have comfortable inventories of oleic, while others were long on stearic.

Several market participants considered 57-62 cents/lb to be low on the oleic range, while others mentioned placing material at prices under the low end of the spread. The range was considered notional this week due to varying commentary and higher prices in August BFT values.

BFT prices in the Chicago cash markets were hovering at 32 cents/lb on August 19, keeping the August tallow fatty acid feedstock up from July averages. There were no changes in the C16 palmitic range, with Southeast Asia FOB prices in a spread of about 38-40 cents/lb last week, according to ICIS pricing.

FEEDSTOCKS

Fatty acids are derived primarily from vegetable oils such as palm and coconut oil. Most fatty acid production is in Southeast Asia, particularly Malaysia, Indonesia and the Philippines. Palm oil is the raw material used for fatty acid production in Malaysia and Indonesia, while coconut oil is used in the Philippines.

In North America, fatty acids are produced primarily from tallow fats. The basic acids from this production are the C18 stearic acids. The production process here utilizes BFT for the main feedstock, which is rendered from cattle and hog material after slaughter. Glycerin is a coproduct of fatty acid production.

OUTLOOK

The Use of oil and fat feedstocks instead of petroleum based feedstocks to make industrial products such as biofuels and plastics is expected to create competition for fattv acids production and or supply this in turn may affect pricing, but these applications are largely dependent on crude oil prices and whether it will make cost effective sense to make the switch, according to SRI Consulting, a global business research firm.

Tax credits and subsidies or environmental legislation are likely to create a competitive advantage for biofuels. The soap and detergent industry competes with biofuels, for use of tallow as a raw material.

(Courtesy : August 31-September 6, 2009, ICIS Chemical Business).

GIVE NUKES A CHANCE

When the reaction stops the endpoint

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With its zero-carbon emissions, nuclear power has a new ally: environmentalists

IN his state of the Union Address on January 27. US President Barrack Obama shocked many of his supporters - and quite a few of his opponents - when he came out in favour of nuclear energy.

The president said; 'To' create more..... clean energy jobs, we need more production, more efficiency, more incentives. And that means building a new generation of sate, clean nuclear power plants in this country."

Later, Carol Browner, assistant to the president for energy and climate change, emphasised, "As the world moves to tackle climate change and diversify our national energy portfolio, nuclear energy will play a vital role."

While environmental groups such as Friends of the Earth consider the Obama plan a betrayal, and have called the president's statements "a kick in the gut." others once in the environmental vanguard have started to rethink their positions.

Stewart Brand, a creator ot the 1960s iconic counterculture handbook. *The Whole Earth catalog*, has relinquished his anti-nuke past. In his new book *Whole Earth Discipline: An Ecopragmatist manifesto*, Brand comes out in favor of nuclear energy, writing, "Radiation from nuclear energy has not kileed a single American.

Similarly, a senior press officer for Greenpeace. Daniel Kessler, writes: "Many environmentalists are against nuclear power because of waste problems, safety issues and the idea that money spent on nuclear is better spent on renewables like wind and solar.

Maybe so, but the drive to reduce global warming emis sions is enough incentive for some to overlook nuclear's shortcomings and give it another try.

The Last nuclear power plant to be commissioned in the US was turned on in 1996.

Henry Sokolski, executive director ot the Nonproliferation Policy Education Center, tells *The Christian Science Monitor*, "It's ironic, but Obama could end up being the biggest pro nuclear power president since Dwight Eisenhower.

(Courtesy : ICIS Chemical Business, February 15-21, 2010, www.icis.com)

GOING GREEN

Detergent chemistry has hit the wall on clean, so it's going green

Mike Lafferty

THE detergent industry is highly competitive, mostly recession proof, and, thanks to chemistry, always changing ever so slightly. It has been years, however, since cleaning chemistry has been the driving force in detergent innovation. Instead, the environment rules in laundry rooms and kitchens. In the United States, for example, on July 1 (2010) 15 states virtually banned phosphates from automatic dishwashing products. That will produce consternation in kitchens - dishes don't seem to come quite as clean without phosphorus, and detergent chemists are trying to figure out what to do.

For clothes, however, the question of "How clean is clean? had been answered by the 1980s—at least in high-end products sold in North America, Western Europe, Japan and Korea.

"The end point for formulalors for laundry detergents is consumer satisfaction. Can they improve on that? Only marginally; garments are clean and probably smell fresh for probably 90%; or more of consumers." said Warren Schmidt, a retired Shell chemist, who is now an industry consultant. "Advancement is driven less by soaps and cleaning and more by bleach and bleach activators and perfumes. Often, the number one way people tell if laundry is clean is, does, it smell fresh."

DETERGENTS TODAY

Today, detergent manufacturers are pushing super-concentrated formulae to reduce packaging and transport costs, changes that address environmental concerns of consumers and economic concerns of formulators rather than new worries about defeating dirt.

Modern detergents are mixtures of surfactants (cleaning chemicals), builders (water softeners), bleaches (to whiten and remove stains), enzymes (to break down soils to simpler forms for removal by detergent), optical brighteners (to create a whitening effect), polymers (to prevent soils from resettling after removal during washing), and fillers. Worldwide, these chemical mixes vary American consumers prefer liquids to powders by a 60-40 margin and the number of powdered detergents available in the United States has shrunk. In contrast, Europeans have a greater choice in detergents because of a wider range of consumer preferences, due in part, to there being many more nations and cultures in Europe. Still, European detergents are more often powders and tablets. except in France. Whereas 60% of the overall European market is powders and tablets, in France, most consumers prefer liquids.

Detergents in Western Europe and North America also have more surfactants, bleach, polymers, and enzymes than those in Africa, Asia, and Latin and South America. In developing nations, manufacturers walk a fine line between effectiveness and expense.

"To produce a product for this market is expensive and the people can't buy expensive." said Heliana Kola, a chemist at Columbus. Ohio. USA-based Battelle's detergent analysis program. "In Latin America, the Philippines, India, they still have a lot of work to do. These countries are poor so they use cheap ingredients. Western Europe. North America, Japan, and Korea are where you find modern detergents where they care about performance of the product but also care for the environment."

Battelle scientists track household cleaning and laundry detergent formulations worldwide. Water-polluting phosphates, for example, have been chased completely from laundry detergents in North America, Western Europe, Japan, Korea, and China, replaced by zeolite, a mineral containing aluminum and silicate. They are also being phased out of products in Eastern Europe, Kola said, although they are still used in India and other Asian and Pacific nations. Even name-brand detergents can vary from region to region. "A product sold in Germany is not the same as in Turkey." Kola said.

A BRIEF HISTORY OF DETERGENTS

Detergents actually have a history as long as that of civilization one of the first things people wanted after they set up house was, apparently, clean clothes Ancient Bain lomans and Egyptians had recipes for making soap. The Romans claim rights to the name when, according to legend, rain washed down the slopes of Mount Sappo, a mythical spot where animals were sacrificed. The rain washed the fat from the sacrificed animals into the Tiber River, along with alkaline ashes from the sacrificial fires. There, washerwomen found the mixture helped gel their clothes clean Animal fat and ashes remained the basis for soap making for thousands of years.

Modern detergents were spawned in 1916 when the first commercial synthetic surfactant was made in Germany from coal tar to get around the shortage of animal fats during World War I. Chemicals builders, which improve the cleaning ability of surfactants, were next to be added. They chelate calcium and magnesium ions in hard water, thus maintaining or enhancing the cleaning efficiency of the surfactant. Later inventions included optical brighteners-enzymes—that attach to fabrics. Now. detergents have up to six enzymes, each one with a particular function or stain target. Further enzyme development has been motivated by environmental concerns - in this case the desire for detergents to perform in a cold-water wash.

KEEPING UP WITH THE COMPETITION

Ironically, for such a competitive business, there aie few secrets. Everyone wants to know what the competition is doing. Although some large companies have their own testing labs, manv companies choose not to spend the money on a lab devoted only to analyzing the competition. In the only

program of its kind, Battelle provides that service to detergent manufacturers and to companies that supply the chemical ingredients.

"By sharing the expense, companies can get the information at approximately 25% of the internal cost of running their own laboratory" said Franco Pala. who heads the operation at Handle's Duxbury Massachusetts. USA. lab. C'ompetitors especially want to know trends. Are companies using a particular surfactant'.' Are they using more or less bleach or enzyme.' "A detergent formulator needs to know what's in (a new name-brand product almost immediately. They need to know in weeks, not months." Pala said.

In fact. Battelle have an Early Warning System that, upon a client's request, provides the chemical composition of a significant new detergent product in short turnaround time, Pala said.

The detergents program was originally started at Battelle's former Geneva Research Centre, in Switzerland, when European companies wanted to know what their competitors were doing to reduce levels of water-polluting phosphates in detergents.

Battelle scientists have noted that Japan is now a leader in detergent innovation. The switch lo concentrated formulations in high-end detergents actually began in Japan in 1987. Concentrates now completely dominate the market in developed countries, with super-concentrated liquid products entering the American market in 2006. Powder concentrates, in turn, spawned concentrated liquids. Today compact powders are spreading into developing regions such as Latin America. Eastern Europe and Southeast Asia.

WHAT'S COMING NEXT

The next major environment push may be a swing away from the petroleum based surfactants that have dominated synthetic detergents since their invention again in high-end products. Not many people think about the source of the cleaning agents in their soaps and detergents but retailers do, and "all natural" is increasingly "in" as a marketing strategy at least in niche products.

"They're very interested in that claim. Price is not really an issue." said Schmidt.

For laundry detergents, the two most significant factors in the American market in the coming decade will continue to be consumer desire to use less energy - to launder their clothes in warm or even cold water - and regulations forcing manufacturers to build high-efficiency washing machines. Pressure to remove water-polluting phosphates from detergents also will continue.

Sodium tripolyphosphate (STPP or phosphate) has been the main cleaning agent in many detergents and household cleaners for decades. Phosphates do a great job by helping surfactants break down grease and remove stains, but they are difficult to remove from wastewater and often end up in rivers and lakes, where they promote algal growth and, eventually eutrophication. Zeolite, the substitute for STPP, was not effective by itself at first, but scientists resolved the problem by combining it with a number of other ingredients such as sodium citrate and silicate.

This brings us back lo the July phosphate ban in automatic dishwashing detergents. Removing phosphates from automatic dishwashing detergents has lagged because it has been difficult to come up with an ettective replacement. Dihwashing-Machine detergents contain only 1-2% surfactant because, otherwise, they would produce too many suds. Phosphate is a reallv key ingredient to enhance cleaning efficiency. In contrast, hand-dish washing detergents contain up to 30% high-foaming surfactants. Making a lot of suds in the sink is part of the cleaning process, but using a hand-dishwashing detergent in an automatic dishwasher would produce a suds explosion.

Mike Lafferty, the retired science writer for The Columbus (Ohio. USA) Dispatch newspaper. 13 a free/once journalist specializing in science, agriculture, environment, and education articles for news-papers, magazines, and electronic publications. He also is editor-in-chief of the Ohio's Natural Heritage book and most recently, co-author of the book. Ohio's Education Reform Challenges: Lessons from the Frontlines.

(Courtesy : Inform, August 2010, Volume 21 (8) 465 - 528).

HEAVE HO JATROPHA

First commercial-scale jatropha crush

Mission NewEnergy Ltd., a vertically integrated biodiesel refiiner headquartered in (Osborne Park, Western Australia, announced in June that it had aggregated, crushed, and shipped commercial quantities of Jatropha oil from its farming network in India to its biodiesel refinery in Malaysia.

Mission collected approximately 1,500 metric tons (MT) of seed, which it believes is the largest single accumulation yet of jatropha seeds. In a company report, Nathan Mahalingam. managing director of Mission NewEnergy, said. "We are extremely pleased with the Indian operation's ability to effectively consolidate mass quantities of seeds from such a wide geographic dispersion." He added. "The achievement of this milestone clearly demonstrates Mission's logistical capability to hardest commercial quantities of jatropha from the network built over the last three years".

Using only basic oil-expelling techniques. Mission extracted and shipped approximately 188 MT of crude jatropha oil. The company is now introducing solvent extraction methods that should lead to a significant increase in oil yield realization, from the current 16% to 20-30%.

Based on Mission's long-term contract farming rates, oil yields using solvent extraction processes, and after by-product realization. Mission's cost base for jatropha-based biodiesel is approximately $64 per barrel ($1.53 per gallon). This cost basis represents a 34% discount to the current price of low sulfur diesel.

(Courtesy : Inform, August 2010, Vol. 21 (8))

WATCH YOUR HEALTH

Dietary guidelines report released

The *Report of the Dietary Guidelines Advisory Committee on the Dietory Guidelines for Americans 2010* was released in June by the US Departments of Agriculture and Health and Human Services.

The Guidelines are reassessed and reissued every five years in light of emerging silence and perceived public health needs. Among the suggestions in the committee's report:

- Decrease "solid" fat (saturated fat) intake from 10% of energy to 7%. Further, limit "cholesterol-raising" fats (saturated fats exclusive of stearate and trans fat less than 5-7% energy.
- Lower daily sodium intake to 1,500 milligrams (mg) from 2.300 mg.
- Eat more low-fat dairy products, vegetables. beans and peas, whole grains, nuts, seeds, and seafood. Specifically the report recommends intake of 250 mg of long-chain polyunsaturated fatty acids per day via consumption of 8 ounces (about 227 grams) of fish per week.
- Cook more and eat out less.
- Understand the idea of "discretionary calories".

In taking aim at the growing problem of obesity, the committee recommended that children should greatly reduce intake of sugar-sweetened beverages and consume less fruit juice. "The single most sobering aspect of this report." Committee chair Linda Van Horn wrote, "is the recognition that we are addressing an overweight and obese American population. . . Everything within this Report is presented through the filter of an obesegenic environment in critical need of change."

RECOMMENDATIONS ON FAT INTAKE

Stephen Phinney a professor at the University of California. Davis, and a proponent of high-protein diets, told the LA Times newspaper that the objects to the "contnued demonization of saturated fats in the committee." He then cited the recent meta-analysis led by Ronald M. Krauss that found no association between saturated fat intake and heart disease or stroke (American Journal of Clinical Nutrition 91:502-509, 2010).

Likewise. Margo Wootan, director of nutrition policy, for the Center tor Science in the Public Interest (a consumer advocacy group based in Washington. DC. USA), takes issue with the rec-

ommendation to limit cholesterol-raising fats in saturated fats exclusive of stearate and trans fat) to less than 5% to 7% of energy calling it "misguided."

"Stearate may not raise cholesterol levels, but it is still not clear whether it contributes to heart disease in other ways. The advice is too complicated, and impossible tor people to tollovv. since stearate is not listed on tm)d labels." Woolan said.

Walter Willett of the Harvard School of Public Health told the Times that the review "represents progress." However, he suggested that the recommendation that the percentage of total fat be less than 35% of calories is out ot date.

"The best available evidence demonstrates that percent of calories from fat in a diet has no hearing on weight loss—a point the dietary guidelines committee acknowledges. It makes no sense to base the dietary guidelines on an outdated recommendation."

The final 2010 guidelines will be released later in 2010. The report available online at hltp://tiny url.com/Dietarv Guidelines.

(Courtesy : Inform August 2010, Vol.21 (8)).

OIL AND FATS PROPERTIES

Their practical value

The physical properties of oils and fats are basic in relation to their practical use. This article will give definitions of some physical properties and discuss their practical importance.

Density

The density of the oil is of great commercial importance because it is required for the determination of the weight of oil in shore- and ship's-tanks.

Because it is impractical to physically weigh a shipment of several hundred tonnes of oil, the volume of oil is measured in tanks that have been calibrated.The weight is then calculated by multiplying by the apparent density.

The formal definition is the weight of a volume of the oil at a defined temperature divided by the weight of the same volume of water at 4^0C. This is the Relative Density. The chosen temperature is 4^0C because water has its maximum density at that temperature.

For practical use in determining the weight of oil in a ship's tank or a storage tank, the Apparent Density is used. The term 'litre weight in air' is self-explanatory. The measurement of the density is carried out in the laboratory and corrected to the actual temperature of oil in the tank, we need to know the volume. The empty head space in the tank (the ullage) is measured and the volume of oil obtained from a calibration chart previously prepared for the tank.

The change in density for most oils is 0.00068 per degree centigrade (it is 0.00071 for the lauric oils) and therefore an error of 1^0C represents 340kg of oil, quite a significant amount.

Accurate temperature measurement is made by the surveyor when sampling the tank. He must make sure the tank contents are fully liquid, with no solid fats at the bottom. The sampling device is first warmed by filling and emptying it. Then samples are drawn at three levels and their temperature taken with an accurate mercury-in-glass thermometer. The sampler should not be exposed to extreme ambient temperatures during this measurement.

Figure I shows a temperature measurement being made on top of a shore tank. Note the un-

Figure 1: Temperature measurement of oil in a shore tank

desirable use of a copper or brass implement Copper is a powerful catalyst for oxidaton of oils.

Colour

The colour of oils enters into trading specifications. The standards and the trade specifications for the colour of oils use the Lovibond scale. Mr. Lovibond was a brewer in the english country town of Salisbury in the 18" century. He devised a system of pieces of glass coloured in red, yellow or blue of increasing intensity to standardise the colour of his production. When measuring red, yellow or orange colours only the red and yellow glasses are needed.

The oil in a glass cell of a standard size is placed in an enclosed box fitted with illumination.The oil colour is matched by using a suitable combination of the graded glasses. Oil colour is generally given in terms of 'Lovibond red and yellow'-A 5 1/4 inch cell is used for refined oil. and a 1-inch cell for the stronger coloured crude oils. Most refined vegetable oils have a near-white colour; Refined palm oil is usually specified at a maximum Lovibond Red of 3.0 m a 5 1/4-inch cell.

The strong colour of crude palm oil (CPO) is due to its content of various carotenoids (pro-Vitamin A). These are partly removed with the use of bleaching earth and partly destroyed at high temperature during refining. Experience shows that poor quality CPO is difficult - or in extreme cases, impossible - to bleach to the specified colour of 3.0. The difficulty is not due to carotene residues, but to colour formed due to deterioration of the oil.

Some laboratories use an empirical bleaching test to decide what treatment is needed in the factory. A scientifically based measure to define bleachability of palm oil was developed by the Malaysian Palm Oil Board (MPOB) and is now part of the buying specification for CPO.

It consists of measurements of colour in a spectrophotometer at two wavelengths in the ultraviolet part of the spectrum. One of these measures the carotene level. Carotene is gradually destroyed by oxidation. The second measures the increase in oxidation products of the fatty acids. The ratio of the two is a sensitive measure of the quality of CPO and is Simple and rapid. It is called the 'Deterioration of Bleachability Index or DOBI.

Another measurement of absorption, this time in the infra-red part of the spectrum, provides a measure of the trans fats content.

Slip melting point

The melting point of solid fats is a basic characteristic used in specifications. It is particularly useful for describing hydrogenated fats and different grades of palm stearin and palm kernel stearin. In the standard method, a thin capillary tube is partly filled with the sample, attached to a thermometer and slowly heated in a water bath. The temperature at which the sample is sufficiently liquid to rise in the tube is taken as the melting point. An instrumental method for determining the melting point was developed Dy MPOB.

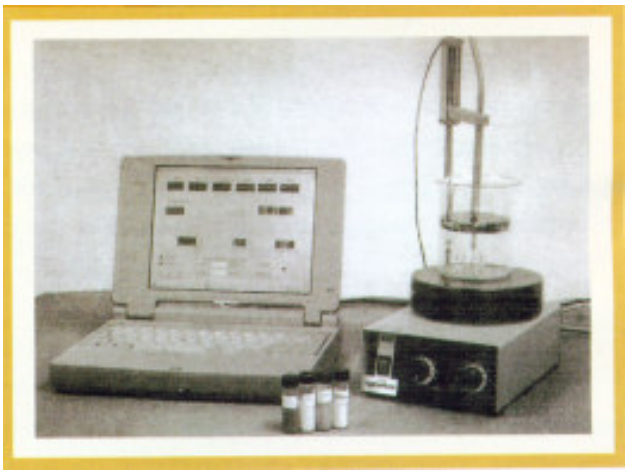


Figure 2: Automatic apparatus for slip melting point ;

Solid fat content (SFC)

The relationship of the SFC with temperature has been used in earlier articles. The SFC is much more informative about the character of a fat than the slip melting point. An example of the marked difference between palm kernel oil - with a rapid change from hard solid to liquid - and palm oil, where the change is much more gradual, is shown in Figure 3.

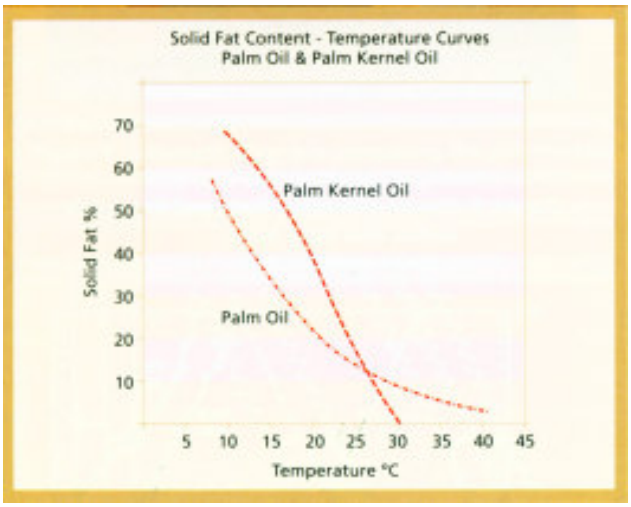


Figure 3: Comparison of solid content of palm oil and palm kernel oil

The method of measurement most widely used depends on the response of a sample to a magnetic field (the Nuclear Magnetic Resonance). The solid part of the fat responds differently from the liquid part. By measuring the fat brought to a range of temperatures. the familiar curves can be prepared.

Cloud Point end Cold Test

These two empirical measurements are used to characterise liquid oils. To determine the cloud point, a tube of the oil is placed in a refrigerated bath and the oil temperature measured it which cloudiness is first observed.

The cold test involves placing a sample in an ice water bath. An oil that remains clear for 5 1/2 hours passes the test. The test indicates the ability of the oil to remain clear when kept in a domestic refrigerator.

Both tests relate to the consumer's wish for a salad or cooking oil to be sparkling clear. Standard palm olein fails to pass these tests. Double fractionation gives improved results, but these are still inferior to the more unsaturated oils.

An acceptable cloud point car be obtained by blending palm olein with liquid oil as shown in Figure 4. A proportion of about 30% of palm olein is suitable. Such blends are already being marketed.

Recently reported research shows that, after interesterification of palm olein with methyl oleate. the new olein matches the chararteristics of liquid oils.

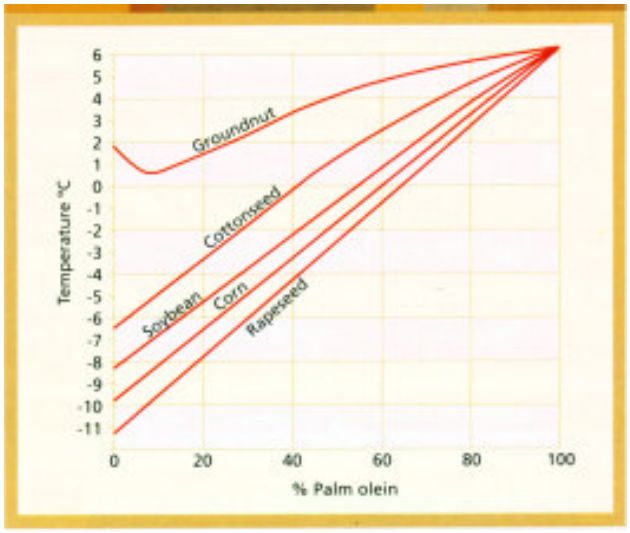


Figure 4: Cloud point of some liquid oils mixed with proportions of palm olein

Smoke Point

The smoke point is of interest in oils to be used for frying. The temperature is measured while observing the steady evolution of smoke from oil being heated in an open vessel. A high smoke point is a desirable characteristic. Smaller more volatile moecules, particularly fatty acids, lower the smoke point and these increase during usage.

Figure 5 shows three curves for smoke point obtained on QMS containing increasing levels of free fatty acids, Curve I. taken from a text book, shows the effect of adding fatty acids to refined oil. Curve 2 was obtained in the same way but using a lauric oil.

Curve 3 was obtained m the MPOB laboratories on used frying oils. It shows that, in addition to free fatty acids, other breakdown products also affect the smoke point.

The lauric oils have a lower smoke point because of their content of the more volatile medium and short chain acids. A high smoke point limit is often specified for frying oils since it indicates a longer life in use.

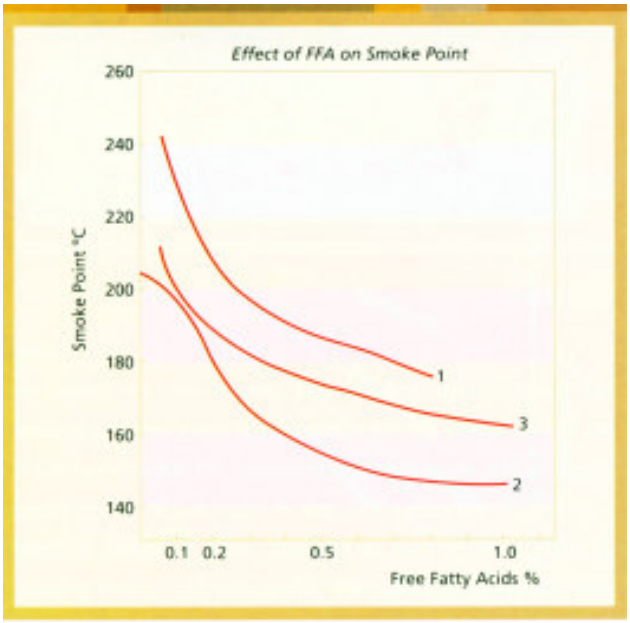


Figure 5: Relationship of smoke point of frying oil to free fatty acid content

Flash Point and Combustion Point

As the oil continues to be heated, smoke evolution increases until the gases can catch light and support combustion. Overheated frying pans are a major cause of domestic fires and are also a problem in restaurants.

The flash point and combustion point are measured by heating the oil in a small closed vessel with a sliding door at the top figure 6). The vessel is fitted with a thermometer pocket and a stirrer. During heating, the door is momentarily opened while a flame is applied to the opening. The temperature at which the evolving gases momentarily light up is the flash point. On further heating the gases will support the flame.This is the combustion point.

A modified apparatus is used for solvent-extracted oils to test that any solvent residues, which have a very low flash point, are not at a dangerous level.

Polymorphism

The desirability of the small crystals of the beta prime (β) formed in shortenings and margarines has been previously discussed. For example, only small crystals can effectively line the air bubbles and stabilise them. In margarine small crystals give a smooth spreadable texture and a good mouth feel.

Figure 6 : Flash point appratus

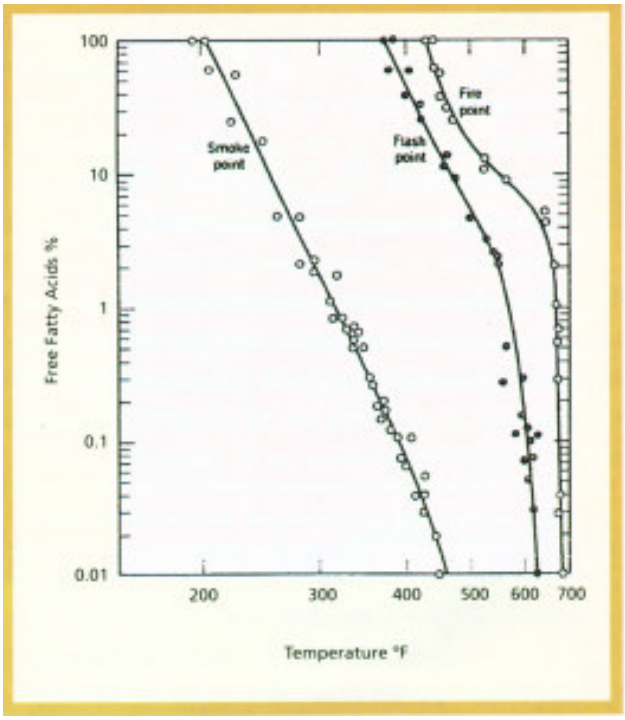


Figure 7 : Curves of smoke, flash and fire points versus free fatty acids

The term polymorphism is applied to the existence of a triglyceride in several crystal forms.

When a molten pure triglyceride is cooled quickly, the (α) form is first obtained. If this is gently warmed it melts, but solidifies again to give the β' form. On further gentle heating, the β' form melts

and re-solidifies in the beta (β) form. This is the final and stable form. The reason for this behav iour" is that the rather long fatty acid chains have difficulty in packing together in the tidy structure that is a crystal. The same behaviour applies to the mixture of the glycerides that is a natural fat figure 8 shows the disposition of the α, β, and β forms of tristearin.

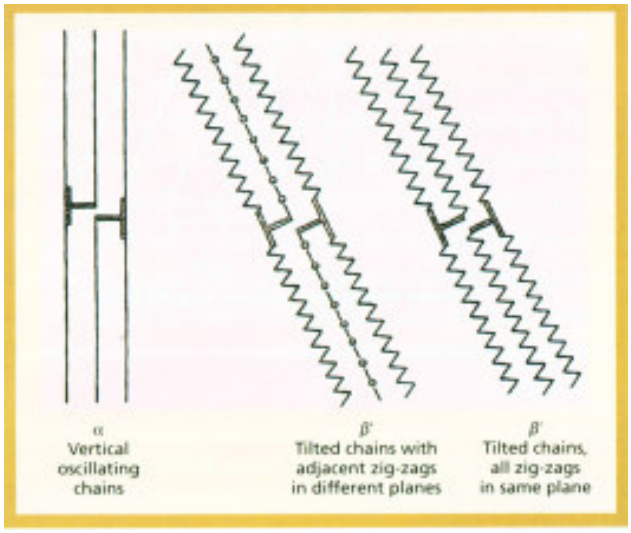


Figure 8: Schematic diagram comparing the polymorphic forms, α, β tristearin (StStSt)

Each triglyceride molecule looks like a chair, with two fatty acids facing one way and the third in the opposite direction. The fatty acids are attached to the glycerol molecule, which forms the seat of the chair, as it were.

In the α form, they are stacked vertically. In the β' form, they are stacked somewhat more tightly at an angle to the vertical. The fatty acid chains are in zig-zag form, with adjacent chains at right angles.This is indicated in the diagram. where the middle chains zig-zag at right angles to the plane of the paper. In the β form, the fatty acids are all aligned.

The different arrangement of the three forms is also evident when we look at arrangement of the glycerides end on, in cross-section (Figure 9).

In the α form, their position is rather random. In the β' form, the layers are aligned at alternate angles, whereas in the most stable *(Greek)* beta

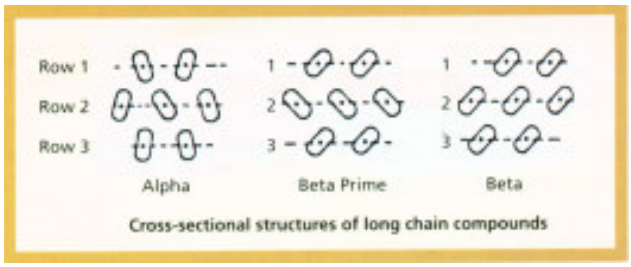


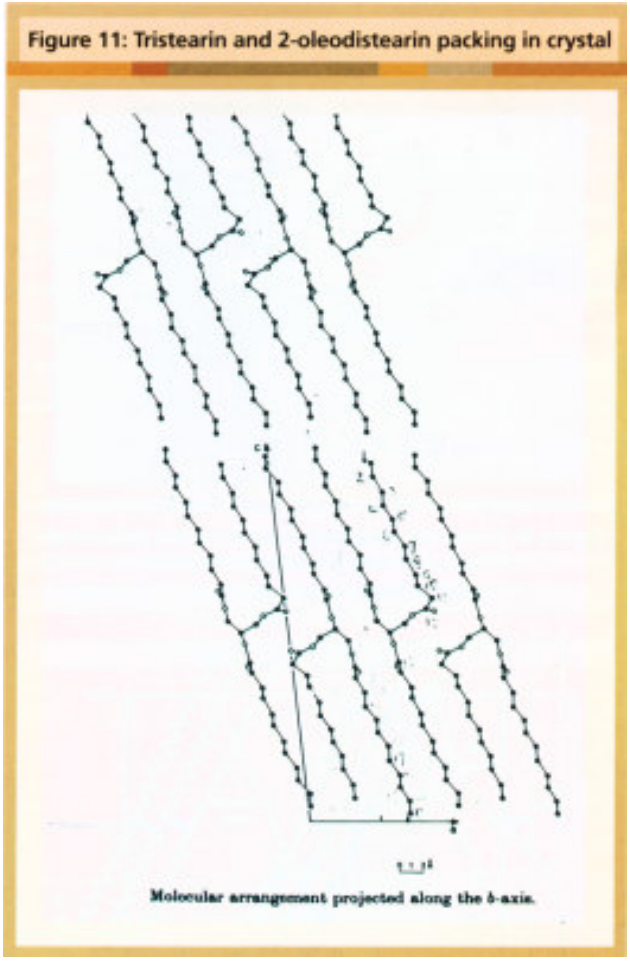
Figure 9 : Cross-section of glycerides in crystal

Figure 10 shows how the layers of glycerides build up into a crystal.Thc examples shows the most stable form of trilaurin with the 12-carbon lauric acid chains.

Figure 10: Layers of glycerides in crystal

The distance between the glycerides within the layer and the distance between the layers are reassured by means of x-ray diffraction. A narrow beam of x-rays is deflected at angles determined by the spacing between the glycerides. The measurements tell us that the glycerides in the a form have the most freedom of movement, while those in the β form have the least.

Figure 11: Tristearin and 2-oleodistearin packing in crystal



Molecular arrangement projected along the b-axis.

The melting points of the three polymorphic fo-Tns of some simple glycerides are given in Table I.

Table 1: Melting Point of Selected Glycerides (°C)

	α	β'	β
Tristearin	54.0	64.0	73.1
Tripalmitin	44.7	56.6	66.4
Trilaurin	15.0	35.0	46.4

The crystallisation behaviour of cocoa butter is more complex than that of other fats. It has six polymorphic forms, of which four are unstable and readily transform into the more stable form V that is required. The main glycerides contain two saturated and one oleic acid.

The final most stable arrangement arrived at is shown in Figure I I, where tristearin is compared with 2-oleodistearin. The bend at the double bond of oleic acid is accommodated in the crystal by aligning with an oleic acid from the adjacent 2-oleodistearin. So, instead of the dimension of a layer being roughly the length of two fatty acids chains, it is the length of 3.

The melting points of the six polymorphs of cocoa butter are shown in Table 2.

Table 2: Physical Forms of Cocoa Butter Crystals

Form	Melting point °C
I	16-18
II	21-22
III	25.5
IV	27-29
V	34-35
VI	36.3

Refractive Index

The speed of light is lower when it is passing through a medium, such as glass, water or other liquid, than it is in vacuum. As a result a ray of light is bent at an angle in the medium. The ratio of the speed of light in a vacuum to that in the medium is the refractive index (RI) of the medium. It is also the ratio of the sine of the angle of incidence to the sine of the angle of refraction. The RI varies with the temperature.

The measurement is made in a refractometer, where the sample is placed between glass prisms,w hich are mantained at a constant temperature by water circualted through a jacket.

The RI varies somewhat depending on thc wavelength of light and this is conveniently controlled in the laboratory by using a sodium lamp, which has a strong yellow line called the D line in its spectrum.

The RI also varies with the chain length of the fatty acids and their unsaturation and it therefore

Table 3: Refractive Index of Selected Oils Measured at 40°C

PKO	1.4569
PO	1.4578
SBO	1.4729
RSO	1.4706

has some value as an identity characteristic. It is listed in Codex Alimentarius and other standard specifications, though for identification purposes it is somewhat outdated.

However it is used for control of the hydrogenation process.The measurement is very rapid, and can be easily earned out close to the plant in the factory, or a continuously recording refractometer can be fitted on the hydrogenation vessel.

A change of 0-00116 in the RI is equivalent to 10 units of Iodine Value, and the accuracy of measurement enables a change of one unit of Iodine Value to be observed. This is sufficient for most purposes. It may DC noted incidentally that, due to the need to minimise trans fats, hydrogenation is much less practised than it was. Hydrogenation is now often used to saturate all double bonds, so producing a zero trans fats, which is then used by interesterification with oils to produce consistent fats.

Kurt Berger
Food Technology Consultant, UK.

(Courtesy : Global Oils & Fats Business Magazine, Vol. 7 Issue 2, 2010).

Feed the WORLD - The question is how?

THERE can be no dispute about the needy to improve the well-being of the world's needy and malnourished. It has been estimated that I billion people, or more than 15% of the world's population, exist below the poverty line and therefore must be malnourished.

Most are concentrated in Africa, Asia and Latin America. Even though a majority of those living in rural poverty are engaged in subsistence farming, they are unable to feed themselves adequately, much less provide food for needy urban populations.

The surge of commodity markets in 2007 and 2008 and the rising cost of food that ensued seemed to catch the UN Food and Agriculture Organisation (FAO) and the food aid community by surprise. This was accompanied by a rapid jump in the cost of ocean transportation that added to the cost of delivering foodstuffs to needy areas. Within a few months, the cost of food grains, edible oils and protein meals delivered under food aid programmes literally doubled.

This meant that by mid-June 2008, funds donated for food aid could only purchase only half as much as 12 months earlier. The current global recession has caused potential donors to reconsider their contributions.This has added to the woes of the poverty stricken and the hungry.

In something of a panic the FAO pleaded to governments of developed countries for increases to its food aid commitments. Its officials joined a growing chorus of complaints that lax market oversight had allowed speculators to drive commodity prices far above their 'real' value, and urged governments to control prices and hopefully, roll them back to 'reasonable' levels.

That most commodity prices did fall rapidly during the second half of 2008 did not satisfy the food aid community. Their complaint was that prices did not fall back far enough to reach previous levels. Therefore, funding still could not provide as much assistance as it used to.

The FAO has begun to peer into the future, and it does not like what it sees. Even though the rate of population growth is slowing, it still foresees a world population in 2050 of about 9 billion people, or 50% higher than current numbers.

How will the world feed itself in 2050? The FAO calculates that if population does not in fact exceed 9 billion people, world food supplies must grow by 70% to accommodate the increase and bring reasonable supplies to the segment of the population that is currently in need.

While the question has been raised most frequently by the FAO, it tends to be ignored or talked around by governments. This is unfortunate since political responses to the question will ultimately become part of the answer.

Difficult answers

If a 70% increase in world food production will be needed to adequately feed the world population by 2050, most of that increase must come from increased yields and productivity rather than from the use of additional land. By some estimates, use of additional land can provide at the most 20% of enhanced world food production.

Some participants in the FAO's 'High Level Expert Forum' have declared that, in order for it to be technically possible to achieve the increase in world food production, developed countries must fund the necessary research and make certain that advanced technologies and agronomic practices are available to farmers in developing countries, especially poor subsistence farmers.

Organisations like FAO and the World Food Programme are always pressuring 'rich' developed countries to put more effort into aid and research funding with some success. However, they do not seem to put nearly as much effort into ensuring that recipient countriesa re using aid money wisely.

It is all well and good for the FAO and NGOs to proclaim what they think is needed to deal with world hunger. Unfortunately, they carefully skirt many of the problems standing in the way of meeting the need because they may involve politically touchy subjects.

For example, in preparation for its 'Expert' Forum, the FAO published a paper entitled 'The Technology Challenge'. It describes the obvious need to increase crop yields, accommodate a warming climate, minimise water use and other Similar points. Yet, it makes no reference to the role that biogenetics can play in meeting the challenges.

Realistically, genetic modification is the key to increasing crop yields and developing seed varieties that will tolerate heat, require less water and mature more quickly while providing greater nutrition. Yet, genetically modified crops (or GMOs) are ignored in the Forum's paper.

The subject of GMOs in the world's food chain has stirred up opposition from many 'back to nature' environmental groups and has become a political issue in the EU, Japan, India and numerous other countries, including some that are the most poverty stricken. Genetic modification is apparently too hot for the FAO to handle.

There are a number of other issues that will affect the ability of the world to feed itself in the future, but these are absent from the FAO's agenda. They include, but are not limited to:

- Trade banners that interfere with the movement of goods and services between countries, including use of food safety and phytosanitary issues to inhibit the free movement of foodstuffs.

- The rush of governments to limit greenhouse gases and the impact such efforts can have on production agriculture; you can bet that the 'feed the world' question is not part of the US Environmental Protection Agency's thought process as it creates rules to regulate carbon emission.

- The fact that the world will continue to need fossil fuels in agricultural production even through 2050 and environmental restrictions thereto.

- The corollary : the use of agricultural products and land to produce bio-fuels will take these away from food use - sharp increases in the blending of corn-based ethanol into gasoline and the use of edible vegetable oils to make bio-diesel were part of the changes in supply and demand relationships that caused higher crop and food prices in 2007 and 2008; higher prices triggered the 'food versus fuel' debate.

- Governance problems in a number of developing countries, such as lack of the rule of law and judicial process, government policies designed to keep local food prices low hoping for political support from urban beneficiaries of low food pnces, and 'misappropriated' aid money.

- Conflicting objectives: the oft-stated desire is to keep farms in many developing countries small and 'sustainable' while also seeking big increases in food production, seeking increased production while limiting increased productivity by ignoring or preventing economies of scale does not stand the test of reason.

- Being critical of farm policies in developed countries that provide income support for farmers, but down-playing policies of developing countries that discourage efforts to increase productivity by keeping crap and food pnces low.

- Acknowledging there is a need to bring more land into food production and that most of the potential land is in South America and Sub-Saharan Africa; then ignoring the virulent opposition from environmentalists to clear new land for agricultural production.

- The use of food and farm policies to achieve social objectives: policies designed to keep small, inefficient farmers in place so they do not flood to overpopulated urban centres is not going to solve food supply problems; a farming unit that is only a few hectares will never be an efficient supplier of food, no matter how much free technology is available

- The FAO, NGOs and others face a dilemma: when agricultural crop prices are high, they complain about increased food cost and the impact on food aid and the world's poor, and when prices are low, they complain that small farmers in developing countries are hurt by the lack of incentive to produce; although they do not often say so, some world food production theorists would like to get rid of markets and let governments control agricultural production and set crop prices.

- The commercial agribusiness sector is conspicuously left out of the FAO discussions on food supply issues: this omission is critical since it is commercial agribusiness that will produce, process and manufacture most of the foodstuffs needed now and in 2050.

Meeting the need

No one disputes the need to increase food production to match a growing world population and the inevitable progression of the added population from a diet dominated by cereals to a more complex one including meat, edible oils, fruits and vegetables. The need is crystal clear What is not clear is how to meet the need in real world terms.

It is the unspoken 'how' part of the question that tends to be ignored because neither the FAO nor its experts know how or are willing to overcome those roadblocks. Since the FAO is part of the UN and thus depends on UN member/donors, it has always been unwilling to tackle these roadblocks head on, presumably out of fear it might offence somebody or some government.

The world population will not be fed by FAO declarations. The process will require real foodstuffs grown or produced somewhere and shipped somewhere else where they are needed. Accomplishing this will require viable economic incentives and efficient economies of scale throughout the entire chain from farm to dining table. And it will require that roadblocks do not stand in the way of efficient movement along that chain.

We have faith that the world will find a way to feed itself in 2050 just as it always has. The process will require some major changes in national and international policies but, ultimately, food production will grow in ways that are economically and commercially viable.

Along the way, could it be that policy makers and food theorists will recognise that a short-term, short-sighted. parochial view of agriculture and world needs is counterproductive, to say the least? Or do we expect too much?

Robert W Kohlmeyer

(Courtesy : Global Oils Fats Business Magazine, Vol 7 Issue 2, 2010

The race to zero-energy homes

DORIS DE GUZMAN

Energy efficient buildings will drive demand for polymers such as expandable polystyrene.

Zero-energy homes no longer entail living in huts or caves. In the near future, people can live, comfortably in buildings with zero net energy consumption and zero carbon emissions with the aid of chemistry, high-technology materials, and the use of renewable energy.

"... lower energy demand from your house first before installing renewable energy systems such as solar panels'*

JACK ARMSTRONG

US-based Dow Chemical touts the use of its *POWERHOUSE* solar shingle's. *DOWTHERM* heat transfer fluids, polyurethanes (PU's). coatings, adhesives, sealant and other energy-saving products in helping create the US state of Michigan's first net-zero energy home built by Cobblestone Builders.

The project. dubbed "Vision Zero", in Bay City, is expected to save $3.507/year (•2857/year) in energy costs and avert 44,855 lb/year (20 tonnes/year) of carbon dioxide (CO_2) emissions.

NET-ZERO ENERGY DEFINED

Citing the US Department of Energy (DoE). Dow Chemical's Mike McGaugh, general manager for Dow Building Solutions. North America, defines a net-zero energy building as a residential or commercial building that uses about 60-70°% less energy than conventional buildings, with the balance of energy needs supplied by renewable technologies.

McGaugh says the Vision Zero home is proof that homeowners can now affordably enjoy the comforts of a modem home with reduced environmental impact and still be able to achieve a net-zero utility bill.

"Homeowners can typically save up to 20% of beating and cooling costs or up to 10% of total energy costs by air sailing and adding insulation in cost-effective locations such as around windows or in attics. The Vision Zero home uses a variety of energy-saving insulation, adhesives and sealants, and weather-barrier solutions products from Dow that are already used in many conventional homes." he adds.

Aside from the solar roofing shingles, other advanced alternative energy technologies incorporated in the house include a solar water heating system, a geothermal water pump to heat and cool the home, and an energy recovery ventilator. The solar components of the house will produce enough energy to supply all needed electricity, and any execess can be sold back to the local utility company.

Cobblestone also incorporated light-emitting diode light bulbs and ultra high-efficiency appliances throughout the house.

While renewable energy is necessary to create a net-zero energy building, implementing efficiency solutions must come first to achieve maximum energy savings, says Jack Armstrong, construction markets leader for North America at German chemical giant BASF.

The company has participated in several zero-energy building projects in the US over the past few years, including a near-zero energy home in Paterson. New Jersey, and a retrofit net-Zero energy demonstration home called ReVISION Vegas, in Las Vegas, Nevada.

"Our mantra is reduce before you produce. You have to lower energy demand from around your house first before deciding to install renewable energy systems such as solar panels," says Armstrong. "Otherwise, the photovoltaic system installed would have to be prohibitively large and expensive."

Particularly in energy-efficient residential insulation systems. Armstrong recommends the use of Insulated Concrete Forms (ICF) with expandable polystyrene (EPS), Structurally Insulated Panel Systems (SIPs) using EPS, and or a hybrid system with an EPS core sandwiched between concrete.

"These newer construction techniques -SIPs. hybrid and ICF - provide environmental and cost benefits, thanks to reduced heating and cooling loads over the lifetime of the home. The lifetime energy- savings outweigh the higher installation costs of these systems," Armstrong adds- BASF it expects the global EPS market to grow by about 5%/year. benefiting from the growing trend towards the use of energy-efficient insulation systems.

FOUNDING PRINCIPLES

The DoE, says that move toward the net-zero

CONSTRUCTION
ZERO-ENERGY BUILDING (ZEB) DEFINITIONS

• **Net-zero site-energy use:** In this type of ZEB, the amount of energy provided by on-site renewable energy sources is equal to the amount of energy used by the building. In the US, "zero-energy building" generally refers to this type of building.

• **Net-zero source-energy use:** This ZEB generates the same amount of energy as is used, including the energy used to transport the energy to the building, thus accounting for losses during electricity transmission. These ZEBs must generate more net electricity than net-rero site-energy buildings.

• **Net-zero energy emessions:** Outside the US and Canada, a ZEB is generally defined as one with zero net-energy emissions, also known as a zero-carbon or zero-emmissions building. The carbon emissions generated from onsite or off site or off-site fossil fuel use are balanced by the amount of onsite renewable energy production. Other definitions include not only the carbon emissions generated by the building in use, but also those generated in the construction of the building are be embodied energy of the structure.

• **Net-zero cost :** In this type of building, the cost of purchasing energy is balanced by income from sales of electricity to the grid of electricity generated on site. Such a status depends on how a utility credits net etectricity generation and the utility rate structure the building uses.
• **Net off -site zero-energy use:** A building may be considered a ZEB if 100-X of the energy it purchases comes from renewable energy sources, even if the energy is generated off site.
• **Off the grid:** standalone ZEBs that are not connected to an off site energy utility facility. They require distributed renewable energy generation and energy storage capability.

Source : US Department of Energy

energy goal, key building energy-efficiency principles such as air tightness, high-efficiency appliances, reflective roofs, energy-efficient fenestration, passive solar techniques, and recovery of waste heat should be applied in combination with renewable energy use.

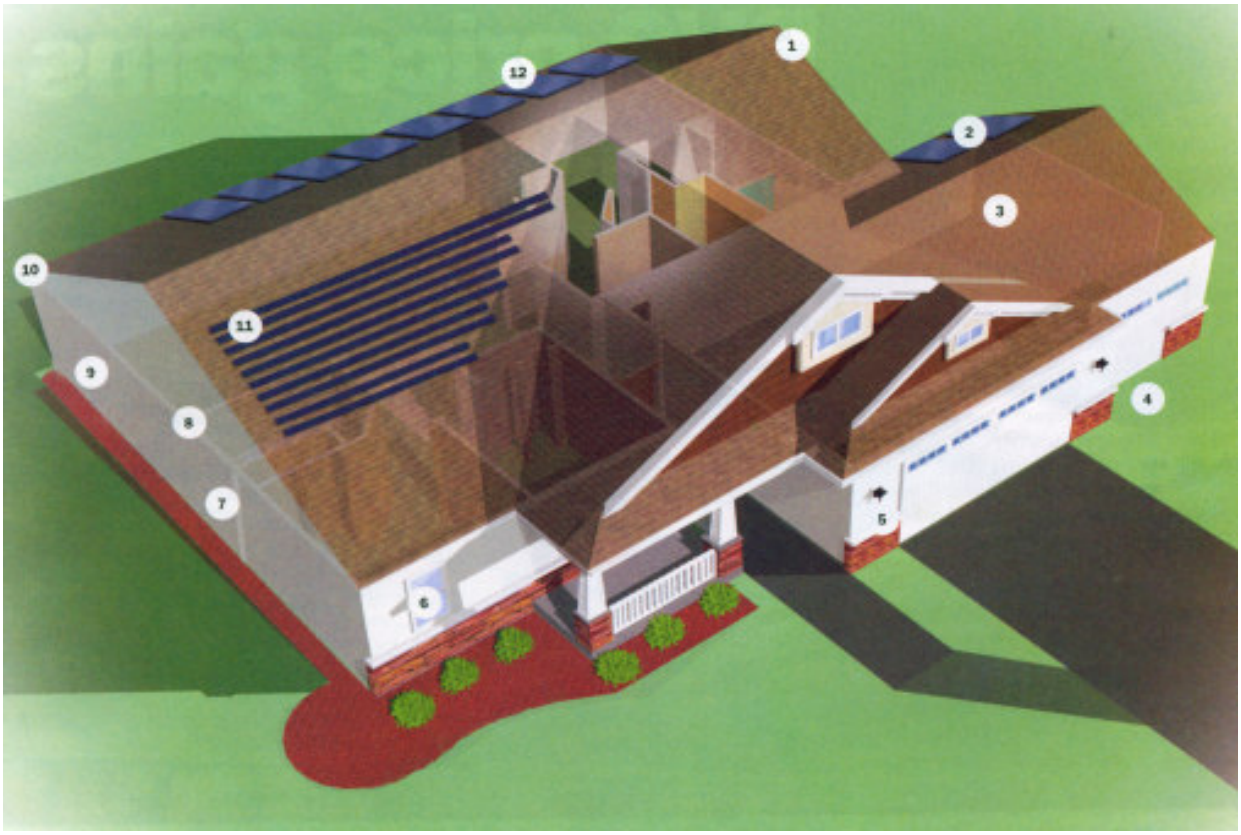
"Advanced energy-saving technology are indispensable to making net-zero energy houses feasible. A net-zero energy house is not a single technology but a suite of closely integrated technologies," the DoE reports.

The DoE notes that residential and commercial buildings account for around 40% of US primary energy consumption, as well as 39% of CO_2, 18% of nitrogen oxides, and 55% of sulfur dioxide emissions.

In June, the DoE awarded $76m (E 61m) to several US companies that included Dow, silicones producer Dow Corning. technology companies Honeywell Internalional and 3M. chemical company Chemtura, and nanotechnology firm Applied Materials, as well as various universities and research groups to develop advanced energy-efficient building technologies and training programs for commercial building equipment technicians, building operators and energy auditors.

The projects aim lo help make US buildings more energy efficient and cost effective, as well as establish a green workforce with technical expertise to reduce energy costs for consumers.

This is the first time that Dow has been able to partner with the DoE to support me development of advanced insulation products, says Bill Jackson, global research and development director for Dow Building and Construction.



1 Dow Structural Insulated Sheathing (SIS) on exterior walls
2 EnerWorks solar panels for water heating
3 Dow Closed Cell Rigid Spray Down & Blown-in Cellulose inside attic
4 Basement energy recovery ventilation system for mechanical ventilation). gray water heat recovery unit: Dow tongue and groove Styrofoam under basement floor): Dow PERIMATE insulation (exterior basement wail board)
5 Energy-efficient-lighting by Kichler and Juno (compact fluorescent lighting]
6 Low-emission Paradigm triple-pane, krypton gas windows
7 Utility meter spins backwards when solar power exceeds house demand selling power back to the utility company
8 Closed cell rigid spray foam inside wall cavity
9 Tongue and groove Stryrofoam in exterior walls
10 30-inch (76cm) overtiang manages solar heat gain
11 Dow POWERHOUSE Solar Shingles
12 Ptiotovoltaic solar panels made with Dow Corning components

HELPING HAND

The company received $3m from the DoE grant to develop next-generation insulation for high-performance, energy-efficient wall, roof, and foundation insulation systems. Dow Corning. meanwhile, received $1.2m to develop of a silicon-based high-efficiency building insulation system.

According to US-based consulting firm Lux Research, global sales of energy-saving green building materials amounted to $62bn in 2009, and are expected to reach $75bn in 2015.

(Courtesy : ICIS, Chemical Business, June 12-18, 2010)

A Step in the right direction

ALLOCATING land towards the cultivation of biofuel feedstocks in East Africa has been said to benefit the local economy and people.

Wachira Kigotho in Nairobi examines different countries' production capacities for eastern Africa's emerging biofuel industry, and which feedstocks are appropriate for the region's climate.

East Africa is developing as an important source of biofuels and biofuel feedstock, with governments

keen to attract direct foreign investment for this potentially strategic rural development option.

Ethiopia, Kenya, Mozambique, Sudan and Tanzania are countries where foreign companies are competing to acquire land for biofuel projects. Already, several are experimenting with jatropha, a feedstock able to survive in harsh scrubland dry conditions with minimum inputs and easy propagation, an ability useful in the region's often harsh environment and climate. Major investors in the region include ProCana Limited and Arranjo Produtivo Local do Alcool (APLA) in Mozambique. Sekab Bioenergy Limited in Tanzania, Kenana Sugar Company Limited in Sudan and Mumias Sugar Company Limited in Kenya Local and foreign biofuels companies have also been trying to obtain prime land to produce sugarcane, palm oil, sunflower, rapeseed, sorghum, soyabean, castor, coconut, and maize for energy production.

According to Harold Liverage, land tenure adviser at the International Fund for Agricultural Development (IFAD), investors have targeted eastern Africa to become a biofuels net exporter, similar to Brazil. "Land requests for biofuel production in the region tend to be between 10,000 and 405,000 ha," said Liversage.

Additional income in Tanzania

While there will be and, in some cases, have already been political, social and environmental problems associated with growing this industry, quoting Tanzanian government statistics. Liversage said this country could easily cultivate 2M ha of land with biofuel crops. Peter Karekezi, the director of the African Energy Policy Research Network, a Nairobi-based non-governmental organisation with interest in energy and environment research and policy issues, stresses jatropha, in particular, has great potential as an east African energy crop.

In addition, studies carried out by researchers at the London-based International Institute for Environment and Development in London indicate biofuels have potential in Tanzania and can provide additional income to small farmers in rural areas.

A report 'Biofuels, Land Access and Rural Livelihoods in Tansania' said Tanzanian biofuel production had the potential to provide a substitute for costly petroleum imports costing between US$1.3 - 1.6 bn/year "Biofuels also have the potential to provide a new source of agricultural income and economic growth in the rural areas." said Fred Nelson, a principal author. A key investor in biofuels within Tanzania is Sekab Bioenergy Tanzania Limited, a major Swedish bioethanol company that has plans to lease over 530,000 ha in Bagamoyo and Rufiji districts. Farming for Energv for Better Livelihoods in Southern Africa (FELISA), a Tanzanian-Belgian joint venture, is targeting production of 10,100 ha of palm oil. 50% from local growers. FELISA also wants to source jatropha from more than 4,000 contracted smallholders.

Diligent Tanzania Limited, a Dutch company working out of Arusha, is already processing jatropha-based biofuel from more than 5,000 contracted local farmers in northern Tanzania. According to Emmanuel Sulle of the Tanzania Resource Forum, farmers have so far planted 4,000 ha of jatropha. "By the end of the year, over 10,100ha of land will be under jatropha in this project." said Sulle.

Mozambique expands capabilities

Looking south, in the last few years, Mozambique has also been expanding its biofuel capabilities. High and unpredictable fossil fuel oil prices on the world market and low sugar prices have encouraged the country to embark on bioethanol production from sugarcane and sweet sorghum, and biodiesel from copra oil, cottonseed oil, sun-flowerseed oil and jatropha.

According to Mozambique's energy minister Salvador Namburete, there is no shortage of land for growing biofuel crops as only 9% of the 36.5 Mha of potentially arable land in the country is currently under tillage. "There are also possibilities of using an additional 40Mha of marginal land currently not being used, said Namburete.

In November last year Mozambique signed two agreements with Arranjo Produtivo Local do Alcool (APLA) a Brazilian consortium of biofuel companies, for a huge US$6bn investment in bio-fuel exploration and development.

Several biofuel investment companies that include ProCana Limited. A subsidiary of UK-based BioEnergy Africa Limited, and UK-listed Principle Energy Limited, an inteternational renewable energy company, have also signed an accord with the Mozambique government to invest US$710M in produce 440M litres of ethanol from sugarcane. According to Koberto Albino, director of Mozambique's Centre for Agricultural Promotion, about 50,000ha have been set aside for the project.

"If all the projects were approved, it would mean by 2020. an area between 80,000ha and 120,000ha under cultivation producing between 835M and 1.6bn litres of ethanol/year." said Albino.

Other biofuel investments

Similar biofuel investments, albeit smaller than those in Tanzania and Mozambique. are projected for Kenya. Ethiopia, and Sudan. Currently, Kenya produces about 20M litres of ethanol annually, notably from its sugarcane industry. The country has plans to increase production to 93M litres of ethanol and 32M litres of biodiesel by 2013. Kenya's Knergy Act 2006 mandates the government to facilitate development of a wide range of biofuel crops that include jatropha, palm oil, soyabean, sugarcane, sorghum, maize, sunflower, castor and rapeseed.

Sudan also has plans to become a major producer of green gasoline. By 2014,, the Khartoum-based Kenana Sugar Company Limited intends to produce 70M litres of ethanol. while the country's Eljazeera Sugar and Ethanol Project is aiming to produce 205M litres of ethanol from sugarcane each year.

Global agro-ecological data compiled jointly by the UN's food and Agriculture Organisation and the Austria-based International Institute for Applied Systems Analysis indicate Sudan has vast potential for biotuel production. "There are 26.3M, ha suitable for cultivation of rain-fed sugarcane and 74M ha for sorghum." said an FAO note.

The Sudanese government is also exploring possibilities of producing green energy from sweet potatoes on 60.7M ha of land, groundnuts (79M ha) and pearl millet (77M ha).

That said, the government in Khartoum might not be the key beneficiary. According to the FAO, the bulk of this potential arable land is in southern Sudan, which is expected to break away from Sudan next year following a scheduled independence referendum.

Further east, Ethiopia was producing only SM litres of ethanol from its sugarcane industry based in the Finchaa region in 2007. This production has gradually increased to 104M litres and should reach 130M litres next year. Despite persistent food shortages that usually hit the country from time to time. Ethiopia developed a comprehensive biofuels development and utilisation strategy in 2007 to facilitate biofuel production to substitute imported petroleum and export excess products.

Currently, there are about 60 foreign and local biofuel developers in Ethiopia. They include Sun Biofuels Ethiopia PLC, a British company that owns 80% of the local National Biodiesel Corporation PLC, scheduled to become the largest producer and seller of biofuels in Ethiopia. Recently, the firm obtained a 50-year lease for 81,000ha of land in the Dandure Woreda district to produce biofuel crops.

The Jatropha Biofuels Industry Company Limited, a local firm, has been allocated 102,000ha to plant jatropha; while Flora EcoPower. a German company, recently invested US$77M into biofuel projects in Oromia regional state.

Emerging development and hurdles

East African biofuel production is therefore on a roll. But, as with all economic development, there are some losers, and the potential environmental fallout from a growing biofuel sector has caused political problems. Concerns have been raised by pressure groups. There are genuine fears that biofuel plantations on marginal land might damage the environment and worsen water scarcity and deforestation. And more seriously in many parts of eastern Africa, biofuel crops are considered a threat to food production, especially in Tanzania and Ethiopia. Tanzania is a case in point its government last October suspended biofuel investments until a thorough food security and environmental impact assessment had been completed regarding biofuel crops production. This followed

local pressure group Environmental, Human Rights Care and Gender Organisation (Envirocare) and Action Aid - the international anti-poverty agency - raising concerns that 5,000 rice farmers in prime land in Kigoma and Lindi districts were about to be evicted to make way for production of jatropha, sugarcane and other biofuel crops.

Abdalhih Mkindi, Envirocare environmental officer, told Oils & Fats International: "The government was willing to accommodate large investors at the expense of small-scale farmers." However, Esther Mfugale, the coordinator of bio-fuel production at the Ministry of Agriculture, said it was not government policy to evict farmers "The government will soon announce its policy and guidelines on biofuels." said Mfugale.

Another issue is thai so-called 'idle' or 'marginal' lands are a source of livelihoods to pastoral communities and indigenous hunter and gatherer tribes. "In Tanzania, tensions between private, local and government actors exist over rights to use land." said Sulle.

According to Oxfam Ireland, most local communities in Tanzania feel their land rights are not well safeguarded under the country's Village land Act (I999). "Communities have lost rights over customary lands and government could alienate it for biofuels production." said Oxfam Ireland in a report on general implementation of land law in Tanzania.

Quite often, government officials and private companies make promises regarding benefits local people should receive from biofuel projects, such as social services and employment, but campaigners say promises are not documented in contracts. "We give out village meeting minutes but nothing ever comes to us in writing." said a resident of Rufiji district. 180 km south of the capital Dar-es-Salaam, where private investors have acquired communal land for sugarcane production.

And this pressure has prompted government action In Mozambique, the government last year revoked a 75,000ha land concession allocated to ProCana in Massingir district along Limpopo River, after protests from local people who had been moved and resettled for biofuel crop production. The revocation was significant in that Mozambique's Land Law (1997) gives government wide powers on land use.

But as Achim Steiner, the executive director of the United Naions Development Programme, said last year in Nairobi "Biofuels are neither a panacea nor a pariah but like all technologies, they represent opportunities and challenges."

(Courtesy : Biofuel issue, June 2010)

OPERATIONAL AUDIT

what exactly do you do?

TAKING part in a three-day Accelerated Leadership Program earlier this year was a terrific and scary experience - because, on the final day, each of us received direct personal feedback from seven of the other participants who had been observing us throughout!

One of my takeaways (aside from the personal insults') was that not everyone was aware of the workings of Operational Audit and therefore I should take every opportunity to "de-mystify" the function. Not only have I taken this to heart, but I am even persuaded to fight for a regular slot in Stolten - so get excited, dear readers!

Operational Audit (previously known as *Operational Review* and often known as *Internal Audit*) is a function established to be independent of management. It is designed to provide independent assurance to the Board that management is maintaining a system of internal controls that is sufficient to manage the Company's risks. Personally, and in my mission to de-mystify, I prefer my less formal definition "To work with management to ensure that our control processes and procedures prevent Stolt Nielsen from getting nasty surprises'" for example, unexpected incidents, losses or liabilities. That is, while we are indeed independent of management, ultimately we are all on the same side in wanting to safeguard the Company's interests. Most companies of our site maintain such an audit function.

Operational Audit has a corporate responsibility to promote all activities which enhance risk management and internal control - for example, compliance with established policies, procedures and standards, etc., but only to the extent that such activities are also effective and efficient.

The discipline of auditing originated in the world of accounting and financial controls and it remains a core element of training for most accounting qualifications. Fortunately, the principles of auditing are easily transferable to non financial control processes - although it will probably come as no surprise that my team and I have financial /accounting backgrounds.

This brings me to my team of auditors, who are:

- Silvia Jamsova. based in Rotterdam (joined March 2009)
- Shehan Goonewardene, based in Rotterdam (joined December 2009)
- Minmin Hong, based in Singapore (joined June 2004)
- Celso Pinheiro. based in London (joined January 2010)

Together with myself - I joined Stolt-Nielsen in October 2008 - the whole team is new and, since early 2009, we have been operating a completely revised audit process.

This might be a good point to clarify quickly that we are not responsible for external auditing. Our external auditor. PwC (PricewaterhouseCoopers), is an independent firm of auditors whose primary focus is to audit our published financial results to ensure that they are fairly stated. However, we certainly share common goals and my team meets with them regularly to share knowledge.

In order to assess whether our processes and procedures are indeed sufficient to prevent Stolt-Nielsen from getting "nasty surprises", we conduct audits of the various parts of the business. We break the organisation down into its main business units, functions, processes and locations, and then design a plan to visit and audit each over a rolling three year period. Depending on the risks associated with each part of the business, some may be audited more than once during any three-year period.

A typical audit is conducted by two auditors who will be onsite for two weeks. Research is done in advance to determine the objectives of each audit - these scope objectives will focus on the key areas of risk where the effectiveness of controls needs to be tested. Following the fieldwork, a report to senior management details the main issues for improvement and the actions which have been agreed with management to fix the issues The report includes an overall audit rating or opinion on the effectiveness of the controls tested.

There are four possible opinion ratings Good; Satisfactory; Less Than Satisfactory; and Unacceptable. The rating is based on the extent to which the scope objectives are achieved or not.

In any given year, we plan to conduct 20 to 25 audits. This means that my team spend approximately 50 per cent of their time away from their home office, conducting audits at our global locations.

So far this year, for example, our work plan has included Crewing & Payroll (Manila); Stolthaven (Santos); Purchasing & Logistics (Rotterdam), STC (Hamburg); Treasury & Payments (Norwalk). and Contracts of Affreightment (Rotterdam & Norwalk) I will resist publishing the overall audit opinions that were awarded - that would be too much fun!

Before I risk getting to the "too much information" stage. I feel I should mention the Audit Committee, something most organisations of our site would have. This has been established as a sub - committee of the main SNSA Board and usually meets on the day before each Board meeting.

My team spend approximately 50 per cent of their time away from their home office, conducting audits at our global locations.

The Audit Committee has been delegated responsibilities to monitor and review-most matters associated with quarterly financial reporting, external audit and Operational Audit, and to report its conclusions to the Board the following day. While I report directly to our CEO, I also report directly to the Chair of the Audit Committee. Consequently, the Execulive Summary from each Operational Audit report issued to management is also pre-

sented to the Audit Committee for review and discussion. This, along with the other information provided by management and the external auditors, enables the Audit Committee to provide assurance to the Board that management is maintaining a sufficient system of internal controls.

Philip Thomas is Head of Operational Audit, based in London.

We break the organisation down into its main business units, functions, processes and locations, and then design a plan to visit and audit each over a rolling three-year period.

(Courtesy : Stolten, August 2010)

Nanotechnology R&D on the rise in beauty worldwide

A new report from the IP Solutions division of Thomson Reuters.*Can nanotech unlock the foundation of youth?* found the beauty industry has made significant investments in nanotechnology to improve the efficacy of personal care products.

Tracking inventions published in patent applications and granted patents from 2003 to 2009, as well as data from 2000 to 2009, the report found that the volume to innovative patents involving nanotechnology in the C&T industry has grown by 103% in the last seven years.

THE NOBLE NOBELS

CHEMISTRY NOBEL TO 3 FOR MOLECULE-BUILDING WORK

Technique assembles chains of carbon atoms to make novel drugs and agrochemicals

Stockholm: Three scientists shared the 2010 Nobel prize for chemistry on Wednesday for forging a knitting to manipulate carbon atoms, paving the way for new drugs to fight cancer and for revolutionary plastics. Richard Hock of the US, and Ehchi Negishi and Akira Suzuki of Japan were hailed for producing “great an in a test tube”.

The trio made outstanding contributions in organic chemistry, a help whose basis is carbon, one of the essential atoms of life and also of innumerable industrial synthetics. “It is important to emphasise the great significance their discoveries have for both academic and industrial research and in the production of fine chemicals including pharmaceuticals, agricultural chemicals and high-tech materials — that benefit society.”

CARBON PIONEERS

Akira Suzuki, Ehchi Negishi and Richard F Heck shared the Nobel prize for Chemistry. The trio developed a process known as palladium-catalysed cross coupling, a means of knitting carbon atoms together so that they form a stable ‘skeleton’ for organic molecules.

It has allowed chemists to synthesise compounds to fight colon cancer, the herpes virus and HIV, as well as smarter plastics that are used in consumer applications, such as ultra-thin computer monitors. The Nobel has been awarded on four occasions for breakthroughs in organic chemistry in 1912,1950, 1979 and 2005 the Royal Swedish Academy of Sciences said.

Through their work, organic chemistry has developed into “an art form, where scientists produce marvellous chemical creations in their test tubes”, it said. Heck, 79, is a professor at the University of Delaware; Negishi. 75, also teaches in the US, at Perdue University in Indiana. Suzuki. 80, is based at Hokkaido University in Sapport, Japan.

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The discoveries “have had a great impart on academic research, the development of new drugs and materials, and are used in many industrial

chemical processes for the synthesis of pharmaceuticals and other biologically active compounds." the academy said.

Last year, Venkatraman Ramakrishnan. Thomas Steitz and Ada Yonath won the Chemistry Prize.

Medicine Nobel for father of four million

Stockholm: Briiam's Robert Edwards. The 'father of the test tube baby', won the 2010 Nobel Prize for medicine on Monday for his work on in vitro fertilisation (IVF), a "milestone" in medicine, the Nobel jury Mid.

"His achievements have made it possible to treat infertility, a medical condition afflicting a large proportion of humanity including more than 10% of all couples world wide." the Nobel assembly at the Swedish Karolinska Institute said.

The IVF procedure entails taking an egg from a woman and fertilising it in the lab-dish with sperm donated from a man. The egg divided is allowed to develop into an Robert Edwards with two test tube babies.

REVOLUTIONARY SCIENCE

Robert Edwards and British gynaecologist Patrick Steptoe established the Bourn Hall Clinic in Cambridge, the world's first centre for IVF therapy.

After he won the Albert Lasker award in 2001, Edwards said he and Steptoe "never thought the embryos would be born abnormal, even though famous people, including Nobel Prize winners, told me that I would have to do infanticide on the babies" early-stage embryo and is then inserted in the woman's uterus, if all goes well, it will become a baby.

Edwards 85, began working on developing the process in the 1950s, first studying germ cells mammals "ready in the late 1950s, he realised that what he knew could be used lo treat women." Nobel committee member Christer Hoeoeg said Out the scientist had to wait until July 25. 1978, for success, with the birth of the world's first "test tube baby". Louise Joy Brown was born at Oldhani and District General Hospital in England by caesarean section, weighing 2.61lbs. Her parents, Lesley and John, had been trying to have children for nine years, but could not because Lesley Brown's fallopian tubes were blocked, since Brown's birth, around four million people have been born through IVF "(Edwards) is not in good health, but I talked with his wife and she was thrilled," jury member Goeran Hansson said, Edwards has described how controversial his work has been. "I was called crazy." he said five years ago. "No one wanted to take the ethical risk. People told me the child would not be normal and wondered what I would do then. But I was never worried.