FRIDGE

Chemicals Sector Summit

Preparation:

Polypropylene Trade Flow Analysis (Step 5)

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EXECUTIVE SUMMARY

Introduction

As part of the FRIDGE study in preparation for the Chemicals Sector Summit, research was commissioned to identify specific growth opportunities for South African resin and plastics producers in the US and EU polypropylene (PP) markets.

This document details the final outputs of the PP trade flow analysis. The analysis reviewed **trade flows for 8 PP commodity groups** identified at HS 6-digit level based on data from ITC TradeMap[1]:

- HS 3902 10 (Polypropylene, in primary forms)
- HS 3902 30 (Propylene copolymers, in primary forms)
- HS 5503 40 (Staple fibres of polypropylene, not carded or combed)
- HS 5607 41 (Binder or baler twine of polyethylene or polypropylene)
- HS 5607 49 (Twine, cordage, rope and cable of polyethylene or polypropylene - excluding binder or baler twine)
- HS 3920 20 (Other plates, sheets and film etc, non-cellular etc, of polymers of propylene)
- HS 6305 33 (Sacks and bags, for the packing of goods, of polyethylene or polypropylene) strip or the like (excluding flexible intermediate bulk containers)
- HS 3917 22 (Tubes, pipes and hoses, rigid; of polymers of propylene).

In addition, a **trade flow analysis for 5 nonwoven commodity groups** was conducted. While nonwovens are not exclusively polypropylene based, they are an important PP application. These products have therefore been included in the analysis, but kept separate from the analysis of trade flows for pure PP commodity groups in order to avoid distortion of the rankings. The following are the five HS 6-digit level product codes for nonwoven products that were analysed:

- HS 560311 Nonwovens, man-made filaments weighing <25g/m2
- HS 560312 Nonwovens, man-made filaments weighing 25-70g/m2
- HS 560313 Nonwovens, man-made filaments weighing 70-150g/m2
- HS 560314 Nonwovens, man-made filaments weighing >150g/m2
- HS 392190 Film and sheet etc, nes of plastics

The statistical analyses are included in Appendices A-C in Excel format.

[1] Detail on the methodology followed is provided in section 2 of the document.

Technical note on trade flow analysis:

- Trade flow analysis allows an examination of export markets according to value, size, and growth, and therefore gives an indication of potential product market opportunities. It is also useful for identifying a country's position in world exports and imports and therefore leading competitors and supply capacity.
- Please note that a trade flow analysis is usually the first step of deeper market opportunity analysis. It is typically followed by a detailed assessment of market drivers and market opportunities on the demand side and an assessment of competitiveness on the supply side. In particular, a comparative cost analysis along the entire value chain (i.e. from sourcing and production through to marketing, transportation and selling in the export market) should be conducted. This is critical to identifying overall cost competitiveness vis-à-vis competing suppliers and the drivers of competitiveness such as capacity and scale. Cost competitiveness is a driver of the likely success of export market penetration for commoditised products, while design, differentiation and quality may become more important for higher value added products.
- Furthermore, the HS approach of categorising products does not clearly differentiate PP at the end use stage of the value chain, and therefore opportunities and growth areas for beneficiation cannot be clearly identified through trade flow analysis. Further research into the market is therefore necessary to reveal opportunities for these end use products, such as market analysis. Although outside the scope of this analysis, market research was therefore conducted to gain more insight into potential market opportunities by supplementing the statistical findings.

Findings on PP products trade flows

Key findings on PP import demand in the US and EU

The total import value for the selected PP products in the target EU and US markets was approximately US$9bn in 2003. The US accounts for 11.5% of this import value, with a total import value of US$1bn in 2003.

The following graph shows the top 10 product-to-market combinations by size of import market:

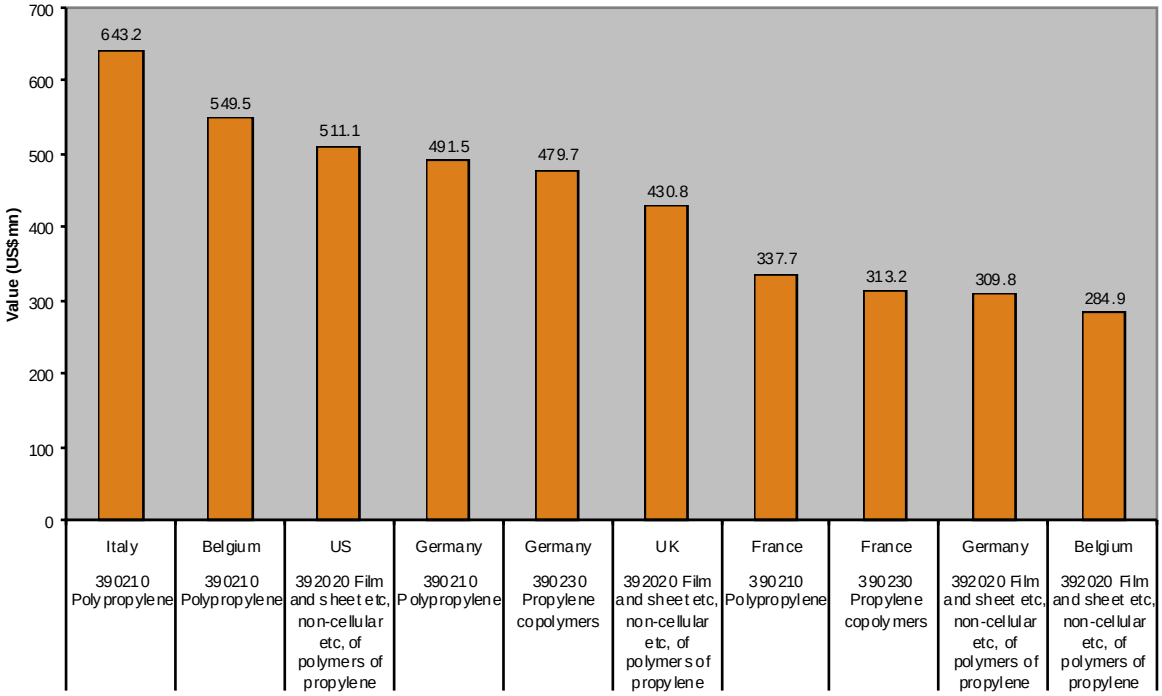

Figure I: Top 10 product-to-market combinations by size of import market in US$ millions - 2003

Demand is greatest for primary products, with 65% of the top 10 product-market combinations by value accounted for by either polypropylene or propylene copolymers. Film and sheet products account for the remaining 35% of the top 10 product-market combinations. European markets dominate these top 10 product-to-market combinations.

However, this trade is dominated by intra-regional trading (intra-EU and intra-NAFTA for the EU and US respectively). Adjusted for intra-regional trade, the total import market value shrinks to US$1.16bn or approximately 13% of the total import market value in 2003, and the US becomes a more important market with 4 of the top 10 product-market combinations.

The following graph shows the top 10 product-to-market combinations by size of import market adjusted for intra-regional trading:

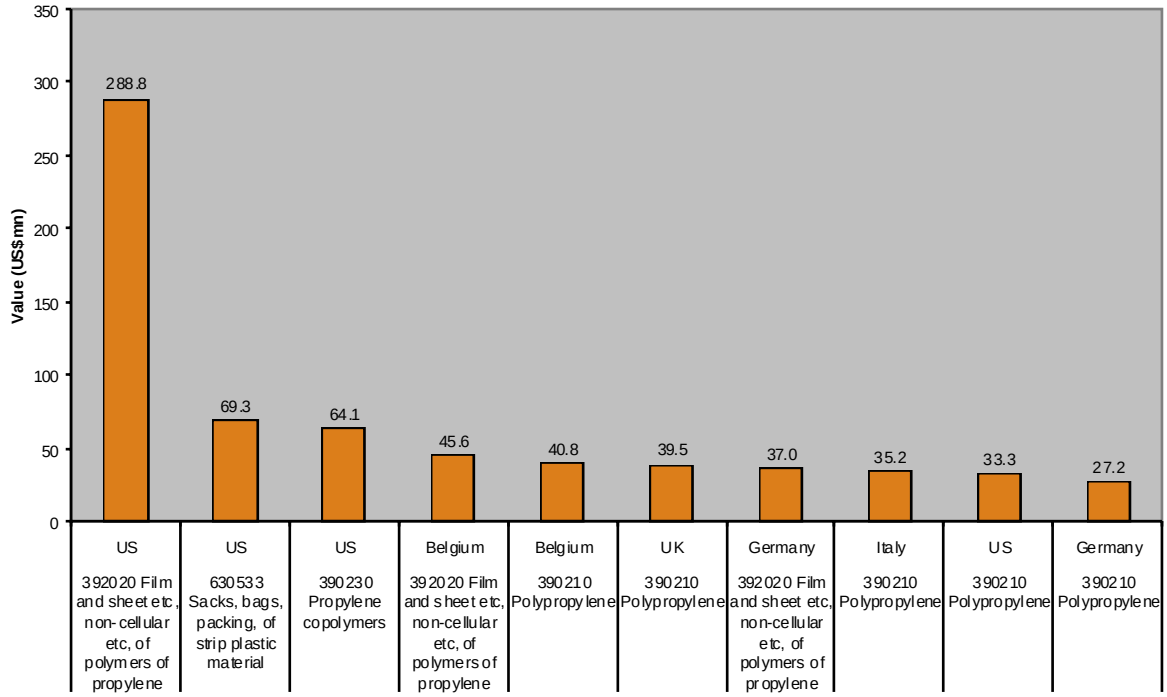

Figure II: Top 10 product-to-market combinations by size of ex EU / NAFTA import market in US$ millions – 2003

Demand for secondary products also becomes more important when intra-regional trade is excluded from the analysis: 65% by value of the top 10 product-market combinations is accounted for by trade in secondary products (in particular films and sheet products), while 35% by value is accounted for by primary products.

The top 15 product-to-market combinations for secondary products ex EU / NAFTA are set out in the table below. Film and sheet products show strongest import demand. There is also strong demand for sacks, bags and packing of strip plastic.

Product	Market	Ex EU / NAFTA Imported value 2003 in US$ thousand	Imported value 2003 in US$ thousand	Import trend in value between 1999-2003, %, p.a.
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	US	288,760	511,148	6
630533 Sacks, bags, packing, of strip plastic material	US	69,313	107,556	6
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Belgium	45,586	284,900	10
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Germany	37,028	309,807	10

Product	Market	Ex EU / NAFTA Imported value 2003 in US$ thousand	Imported value 2003 in US$ thousand	Import trend in value between 1999-2003, %, p.a.
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	France	25,220	280,460	9
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Netherlands	23,558	162,650	11
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Italy	22,313	193,999	6
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	UK	22,186	430,790	16
630533 Sacks, bags, packing, of strip plastic material	Germany	20,551	29,077	19
560749 Twine nes, cordage, ropes and cables, of polyethylene or polypropylene	US	19,360	41,180	13
630533 Sacks, bags, packing, of strip plastic material	Italy	14,648	18,264	7
560741 Binder or baler twine, of polyethylene or polypropylene	US	14,465	18,975	7
630533 Sacks, bags, packing, of strip plastic material	Belgium	11,418	15,183	10
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Ireland	10,321	46,641	11
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Spain	9,823	170,166	10

Key findings on PP supply from South Africa

In 2003, South Africa exported a total of US$105.7m across the 8 PP commodity groups tracked in this analysis. The vast majority of exports went to African countries, in particular Nigeria and Zimbabwe which accounted for 13% and 10% of total exports respectively. Hong Kong is the only significant non-African export market for South African polypropylene products, and the largest trading partner with 20% of total exports.

Based on the definition of the industry value chain used, there currently appears to be only limited beneficiation of PP products for export. In 2003 approximately 93% of total PP exports in value terms were in primary form.

With respect to current trade relationships in the target regions of the US and EU, Germany is the main trading partner for PP products. The following table shows the top 10 existing PP supply relationships in the target markets based on SA export value in 2003:

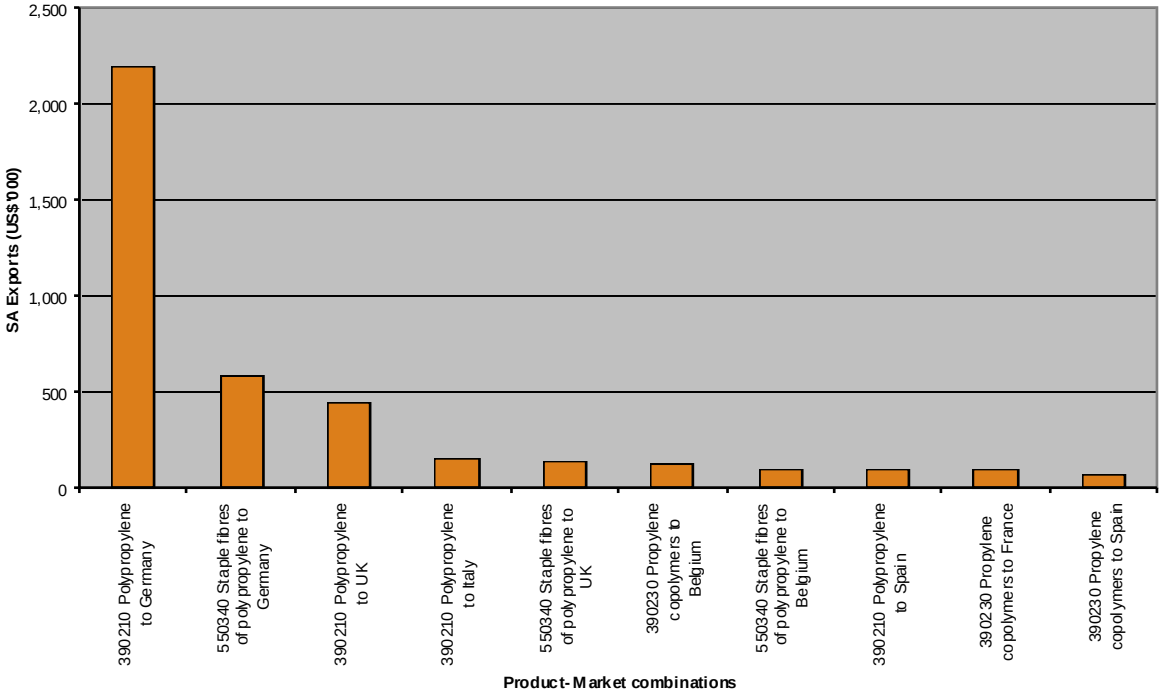

Figure III: Top 10 existing PP supply relationships by SA export value in 2003

Please note that no current South African supply of PP products to the US market is reflected in ITC trade statistics.

Overall, South Africa's penetration of the target export market is very low – i.e. South Africa's % share of market value for the product-market-opportunities analysed is typically <0.01%. However, for HS 550340 (Staple fibres of polypropylene, not carded or combed) South Africa has a share of market value of between 0.75% - 2.1% in Germany, UK, Belgium and Austria.

Recommendations on high potential PP product-to-market opportunities based on trade flow analysis

In order to identify high potential product-to-market opportunities, a multiple ranking analysis based on the following demand-side factors was conducted (please refer to section 2.4 for a detailed description of this methodology):

- Import market size - imported value 2003 in US$ thousand
- Import market size adjusted for intra-regional trade - imported value 2003 in US$ thousand, excluding intra-EU/intra-NAFTA trade
- Import market growth - import trend in value between 1999 and 2003, %, p.a.

Following input from the constituencies, the possibility of using **relative labour intensities** of the various PP product categories as an additional ranking measure was investigated. The labour intensity of PP production is affected by various factors including:

- Process used in production, e.g. extrusion as opposed to injection moulding
- Product type
- Size of plant
- Capital intensity of plant

As the brief was to conduct trade flow analysis and not a detailed analysis of the current and future structure or the South African PP industry, it has not been possible to collect the necessary information on the above drivers of labour intensity that would be required to estimate relative labour intensity. However, based on brief discussions with socio-economic impact specialists[2] and industry players[3], it is evident that the production of primary PP products is, in general, less labour intensive than the production of secondary PP products, although both primary and secondary polypropylene products are relatively capital intensive compared to many other sectors. Employment growth is therefore likely to be generated by creating new downstream activity and selecting sufficiently large-scale opportunities that can absorb labour. Therefore, labour intensity has not been added as an additional ranking criterion; and it was rather recommended that it is considered during the design phase of new plants that might be developed to realise these market opportunities, in order to address the joint objectives of competitiveness, growth, employment and equity.

The outcome of this ranking analysis highlighted the following high potential product-to-market opportunities for further investigation:

Product	Market	Imported value 2003 in US$ thousand	Ex EU / NAFTA Imported value 2003 in US$ thousand	Import trend in value between 1999-2003, %, p.a.	SA Exported value 2003 in US$ thousand	SA % share of market value	% of South Africa's exports of the product
390210 Polypropylene	Spain	221,756	18,153	27	100	0.05%	0%
390210 Polypropylene	Denmark	177,396	10,306	16		0.00%	
390210 Polypropylene	Belgium	549,516	40,763	17	69	0.01%	0%
390210 Polypropylene	UK	258,261	39,504	16	453	0.18%	1%
392020 Film and sheet etc, non-	US	511,148	288,760	6	0	0.00%	0%

[2] Global Insight
[3] In particular, Sasol Polymers and Sasol polypropylene division

Product	Market	Imported value 2003 in US$ thousand	Ex EU / NAFTA Imported value 2003 in US$ thousand	Import trend in value between 1999-2003, %, p.a.	SA Exported value 2003 in US$ thousand	SA % share of market value	% of South Africa's exports of the product
cellular etc, of polymers of propylene							
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Belgium	284,900	45,586	10	0	0.00%	0%
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	Germany	309,807	37,028	10	0	0.00%	0%
390210 Polypropylene	Italy	643,218	35,233	4	152	0.02%	0%
390210 Polypropylene	Germany	491,495	27,245	6	2,201	0.45%	3%
390230 Propylene copolymers	France	313,154	25,501	9	97	0.03%	0%
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	France	280,460	25,220	9	63	0.02%	2%
392020 Film and sheet etc, non-cellular etc, of polymers of propylene	UK	430,790	22,186	16	0	0.00%	0%

Please note that the product-to-market opportunities in the darker cells represent the highest potential opportunities based on the three selected demand-side ranking criteria. These combinations scored highly on all three criteria.

The product-to-market combinations in the paler cells represent high potential opportunities – they scored highly on two of the three ranking criteria (i.e. within the top 15 in terms of total import market size, within the top 15 in terms of total import market size adjusted for intra-EU/intra-NAFTA trade, and/or top 30 in import market growth terms).

Primary PP products were included in this analysis, as although the emphasis is on beneficiation, US and EU markets for primary PP are relatively large and may present opportunities for South Africa.

Opportunities for primary product exports

Overall exports for primary PP products to European markets present the strongest potential market opportunities.

Based on trade flow analysis, the most attractive primary product-market combinations are for HS 390210 Polypropylene in Spain, Denmark, Belgium, the UK and France. South Africa currently supplies US$78,221,000 of this product, mostly to African countries and Hong

Kong. Exports to Europe are limited with only 3% being exported to Germany and 1% to the UK, and less than 0.5% to Italy, Spain, Belgium, France, Portugal and Austria.

Major competing countries for supplying to these markets are Belgium, Netherlands, Germany and France. Non-EU competitors include Norway and Saudi Arabia.

Italy and Germany are attractive markets for HS 390230 Propylene copolymers. South Africa exported US$19,749,000 of this product in 2003, but exports to EU countries were limited with 1% going to Belgium and less than 0.5% to France and Spain.

The major competing country for supplying propylene copolymers to Italy and Germany is Belgium which supplies just under a third of imports by each country. Non-EU competitors include Japan, the US and Norway.

Opportunities for secondary product exports

Based on trade flow analysis, HS 392020 film and sheet is the most attractive secondary product with potential market opportunities in the US, Belgium, Germany, France and the UK. South African market penetration was low with 2% of its US$4m total exports of this product going to France, accounting for less than 0.5% of imports into France.

Major competing countries for supplying to these high potential markets are Canada, South Korea, Germany and Japan for the US, and Germany, France and Italy for the European markets. Non-European competitors include the US and Turkey.

Findings on nonwovens trade flows

Key findings on nonwovens import demand in the US and EU

The total import value for the selected nonwoven products in the target EU and US markets was approximately US$5.2bn in 2003. The EU accounts for the majority of this demand, buying 82% of this import value, with a total import value of US$4.3bn in 2003.

The following graph shows the top 10 product-to-market combinations by size of import market:

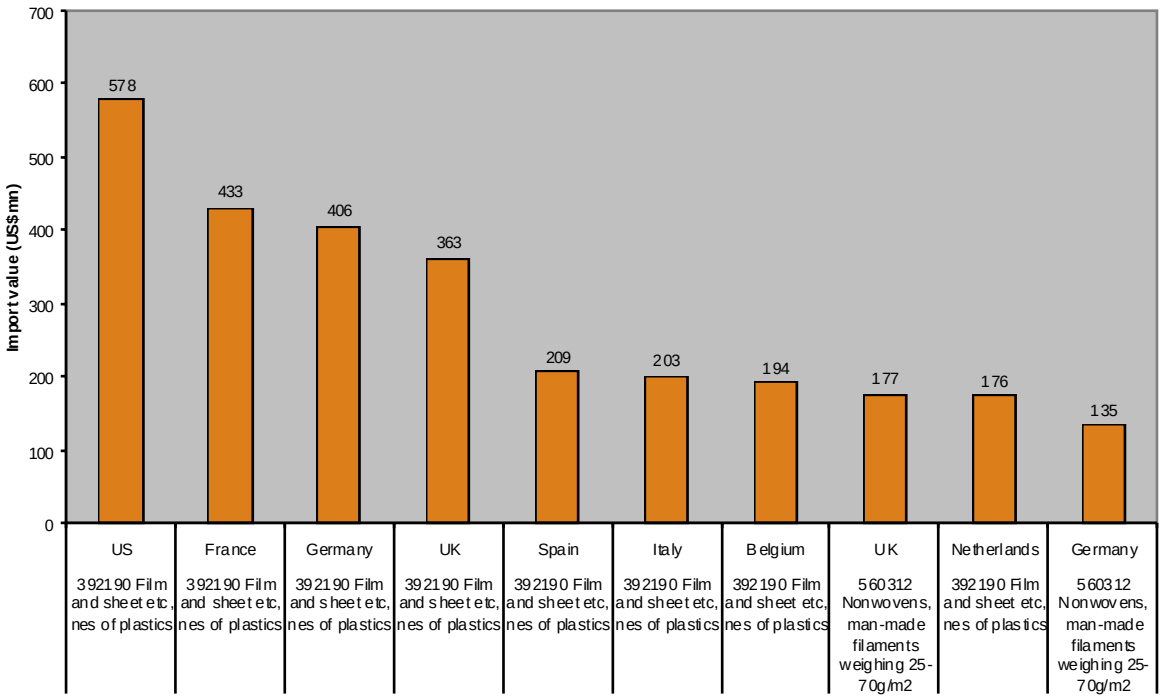

Figure IV: Top 10 product-to-market combinations by size of import market in US$ millions - 2003

The greatest demand is for HS 392190 Film and sheet in the US and in EU countries, and HS 560312 Nonwovens weighing between 25 and 70 g/m^2 in the UK and Germany.

When adjusting for intra-regional trading, US imports are not greatly affected, with non-NAFTA imports accounting for 70% to 80% of imports. The EU market is however greatly reduced, with extra-EU trade amounting to between only 11% and 20% of total imports.

The following graph shows the top 10 product-to-market combinations by size of import market adjusted for intra-regional trading:

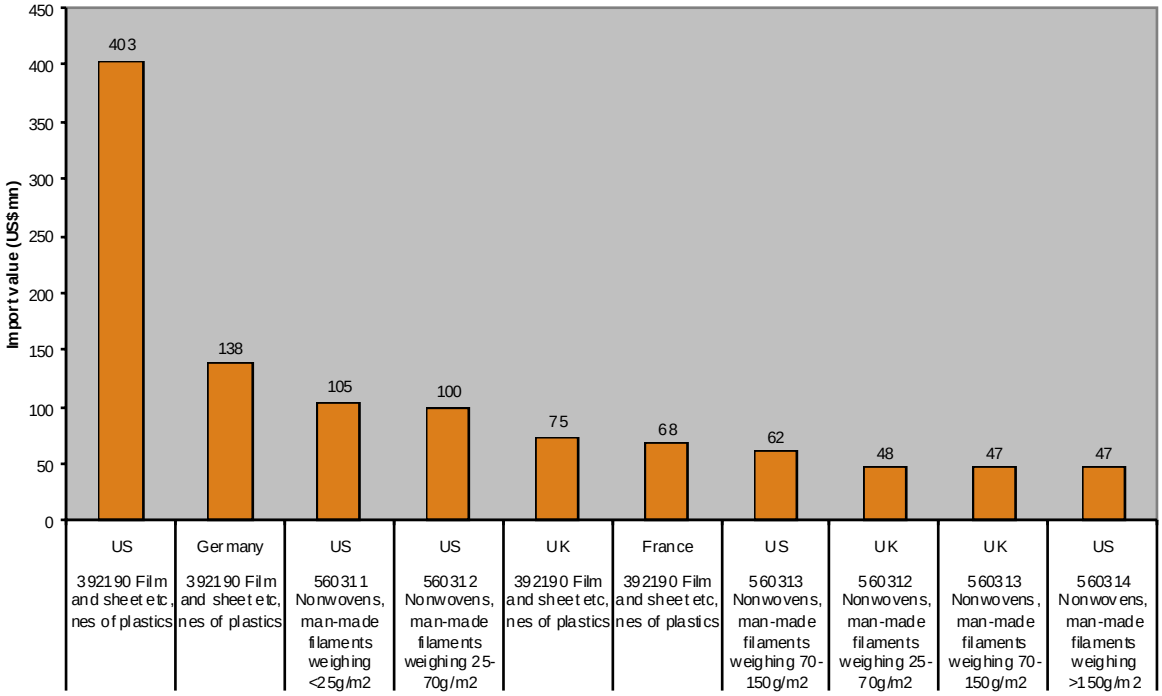

Figure V: Top 10 product-to-market combinations by size of ex EU / NAFTA import market in US$ millions – 2003

When adjusted for intra-regional trade, the US and UK markets become more important for a wider range of product categories while Germany and France remain important markets for HS 392190 Film and sheet, nes of plastic.

Key findings on nonwovens supply from South Africa

In 2003, South Africa exported a total of US$29.8m across the nonwovens commodity groups tracked in this analysis. The majority of exports went to EU countries, with 24% of exports going to Belgium. Only 5% of total nonwovens exports from South Africa went to the US in 2003.

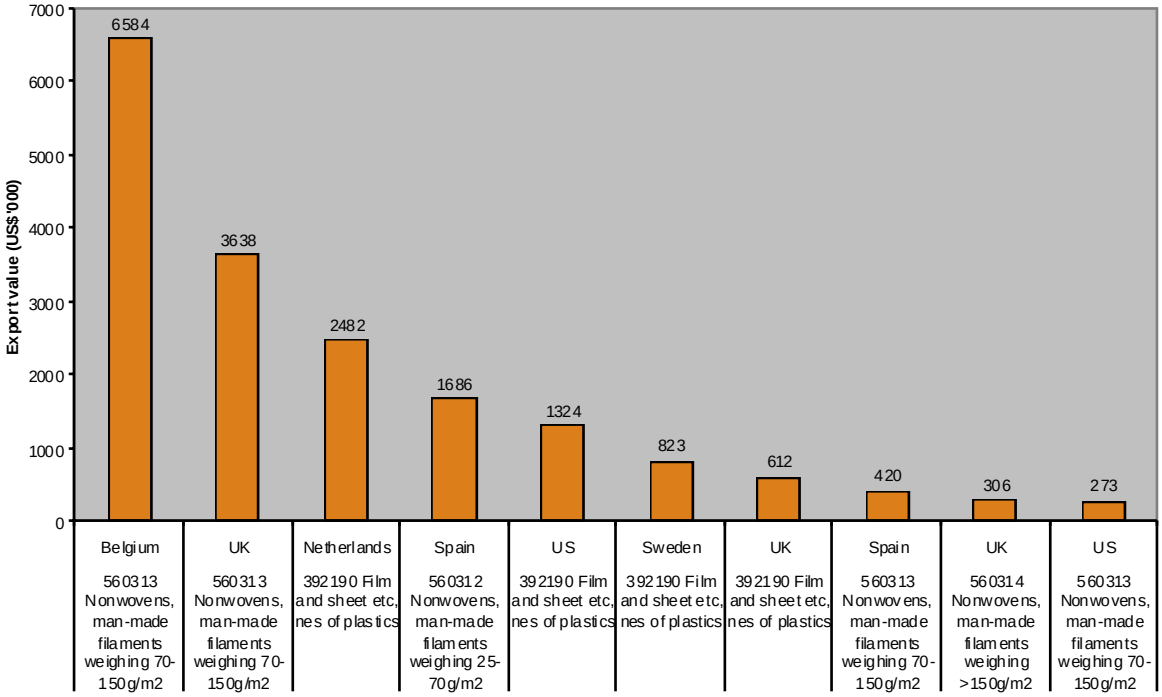

Figure VI: Top 10 existing PP supply relationships by SA export value in 2003

Overall, South Africa's penetration of the target export markets is very low – i.e. South Africa's % share of market value for the product-market-opportunities analysed is typically <3%. However, for HS 560313 Nonwovens, man-made filaments weighing 70-150g/m2, South Africa has a share of market value of 20% in Belgium and 8% in the UK.

Recommendations on high potential nonwovens product-to-market opportunities based on trade flow analysis

In order to identify high potential product-to-market opportunities a multiple ranking analysis based on the following demand-side factors (please refer to section 2.4 for a detailed description of this methodology) was conducted:

- Import market size - imported value 2003 in US$ thousand
- Import market size adjusted for intra-regional trade - imported value 2003 in US$ thousand, excluding intra-EU/intra-NAFTA trade
- Import market growth - import trend in value between 1999 and 2003, %, p.a.

The outcome of this ranking analysis highlighted the following high potential product-to-market opportunities for further investigation:

Product	Market	Imported value 2003 in US$ thousand	Ex EU / NAFTA Imported value 2003 in US$ thousand	Import trend in value between 1999-2003, %, p.a.	SA Exported value 2003 in US$ thousand	SA % share of market value	% of South Africa's exports of the product
560311 Nonwovens, man-made filaments weighing <25g/m2	US	119,902	104,755	17	0	0%	0
560312 Nonwovens, man-made filaments weighing 25-70g/m2	US	120,126	100,291	17	0	0%	0
560312 Nonwovens, man-made filaments weighing 25-70g/m2	UK	177,389	47,755	12	0	0%	0
560313 Nonwovens, man-made filaments weighing 70-150g/m2	US	74,456	61,504	25	273	0%	2
392190 Film and sheet etc, nes of plastics	US	578,250	403,441	5	1324	0%	11
392190 Film and sheet etc, nes of plastics	Germany	405,597	138,430	0	40	0%	0
392190 Film and sheet etc, nes of plastics	France	432,542	68,210	4	264	0%	2
392190 Film and sheet etc, nes of plastics	UK	363,163	74,639	3	612	0%	5
392190 Film and sheet etc, nes of plastics	Italy	203,180	33,979	0	0	0%	0
392190 Film and sheet etc, nes of plastics	Belgium	193,910	23,364	5	68	0%	1
392190 Film and sheet etc, nes of plastics	Austria	117,151	28,953	7	0	0%	0
560312 Nonwovens, man-made filaments weighing 25-70g/m2	Germany	134,661	26,457	10	0	0%	0

Product	Market	Imported value 2003 in US$ thousand	Ex EU / NAFTA Imported value 2003 in US$ thousand	Import trend in value between 1999-2003, %, p.a.	SA Exported value 2003 in US$ thousand	SA % share of market value	% of South Africa's exports of the product
392190 Film and sheet etc, nes of plastics	Spain	208,831	16,341	11	0	0%	0
560312 Nonwovens, man-made filaments weighing 25-70g/m2	Spain	69,419	2,883	37	1686	2%	51
560311 Nonwovens, man-made filaments weighing <25g/m2	Germany	95,333	7,968	12	91	0%	51
560312 Nonwovens, man-made filaments weighing 25-70g/m2	Italy	57,705	14,664	9	0	0%	0

Please note that the product-to-market opportunities in the darker cells represent the highest potential opportunities based on the three selected demand-side ranking criteria. These combinations scored highly on all three criteria.

The product-to-market combinations in the paler cells represent high potential opportunities – they scored highly on two of the three ranking criteria (i.e. within the top 15 in terms of total import market size, within the top 15 in terms of total import market size adjusted for intra-EU/intra-NAFTA trade, and/or top 30 in import market growth terms).

Opportunity for HS 560311 – 14 Nonwovens

The US and UK represent the greatest opportunity for these products, with the market for nonwovens, man-made filaments HS 560311 weighing <25g/m2, HS 560312 weighing 25-70g/m2, HS 560313 weighing 70-150g/m2 in the US and the market for HS 560313 nonwovens, man-made filaments weighing 70-150g/m2 in the UK the most attractive. Leading competing countries for the US nonwovens market include Israel and Italy for HS 560311, Italy and Canada for HS 560312, and Germany and Mexico for HS 560313, while leading suppliers of HS 560313 to the UK were Germany and the Netherlands.

The markets for HS 560312 were also attractive in the EU, with Germany, Spain and Italy showing strong growth in demand, but a substantially reduced demand when adjusted for intra-regional trade, with main supplier including Italy, Luxembourg, Germany, France, and Belgium.

South Africa tends to supply a fair amount of its nonwoven exports to the EU: of the US$179,000 of HS 560311, 91% was supplied to Germany. Also, of the US$3.32m of HS 560312 supplied by South Africa, 51% went to Spain and 19% to Belgium, and just over 87% of South Africa's exports of HS 560313 were supplied to EU countries.

Opportunity for HS 392190 Film and sheet

The US is the most attractive market for this product, and as it is not substantially affected when adjusted for intra-regional trade shows strong potential. Additionally, EU countries including Germany, France and the UK offer opportunities, but demand is significantly reduced when discounting for intra-regional trade.

Leading supplying countries to these markets are Switzerland, Italy, Germany and France. South Africa supplied US$12,301, with 20% going to the Netherlands, 11% to the US, with smaller amounts going to other EU countries including Sweden, the UK, France, and Ireland.

Other findings on market trends and end-use market opportunities

Market research additional to trade flow analysis was conducted to investigate the opportunities in the downstream segment of the market and areas that could not be addressed by trade flow analysis. Due to its increasing performance characteristics PP can be used in a vast array of applications. Further, its lower cost is driving increasing substitution of other plastics. In particular, PP is replacing high-density polyethylene (PE), engineering plastics, and polystyrene in many applications. A review of market research literature has shown that there are potential areas for growth in PP demand in packaging, building and construction, and automotive applications. Although this review is not exhaustive, it gives an additional indication of where attractive market opportunities may be.

Packaging

In the US and many of the European markets the packaging industry is the largest end-user of PP resins and plastic materials. In particular, PP film is used in a wide range of packaging applications, including food and cigarettes packaging. However, there are also opportunities for PP foams in this market.

Potential opportunities include:

- Flexible packaging
  - Oriented PP films for snack and confectionary packaging; and non-oriented PP films which are used for textile products, confectionery, and fish and meat product packaging.
  - PP is substituting PE and foil use and there is a trend away from rigid packaging materials. PP is showing strong growth rates in the target markets.
  - Best potential opportunities are in the food packaging markets – especially snack foods and baked goods.
- Caps and closures
  - PP is increasingly used for threaded plastic pressurised caps due to its competitive price and performance characteristics (i.e. it moulds well to the threaded bottle neck)
- Plastic containers
  - PP is one of the fastest growing resins for plastic containers substituting high-density polyethylene. However, PP use is still low volume in comparison to high-density polyethylene and polyethylene terephthalate (PET).
  - Growth opportunities are driven by demand for bottled water and for single-serving containers for beverage and food items.
- Protective packaging
  - There are growth opportunities for polyolefin foams in this market due to their scratch protection and cushioning capabilities.
- Sterile medical packaging
  - Plastics dominate sterile medical packaging; however paper/paperboard, glass, metal and other materials will continue to be important. Packaging products are often made from a combination of materials such as plastics,

nonwovens, foils and paper to provide a cost-effective solution to packaging problems.
- Growing demand is driven by an increase in surgical procedures and diagnostic testing.

Personal hygiene and medical

Market research has shown that 36% of nonwovens are made from PP, and that PP and PET have increasingly substituted in the nonwoven industry[4]. Disposable personal hygiene and medical fabrics are key applications for non-wovens accounting for around 33% of demand in Europe and 24% in the US. Potential opportunities for PP products in this sector include:

- Disposable nonwovens
  - There is strong growth in nonwoven personal protection goods, especially adult diapers and shields.
- Spunbonded nonwoven fabrics
  - Applications include hygiene cover stock and medical fabrics, disposable protective apparel, and fabric softener dryer sheets (as well as a range of industrial and automotive applications).
  - Polypropylene is the most widely used polymer for the production of spunbonded nonwovens because it provides the highest amount of fibre per unit of weight and the highest level of opacity, as well as the lowest cost due to its low density.
- Carded nonwovens
  - Historically, polyester was the material most commonly used to produce carded nonwovens.
  - However, there is an increasing use of carded webs for hygiene coverstock and wipes. For these products, polypropylene has become the raw material most often used.
- Surgical drapes

Automotive

Market research conducted indicates that this sector has strong growth potential for PP products including foam and fibres. Growth in PP demand has been identified for the following applications:

- Step/running boards have been identified as a growth area for long glass PP
- Headliner energy absorbers are identified as a growth area for EPP bead foams due to in-mould skin/foam lamination technology
- Sun visors are another growth area for EPP application due to multidensity-part integration
- PP is being used increasingly in the production of automotive exteriors such as bumper facia,[5] fender liners, trim and front wings
- European End of Life Vehicle (ELV) legislation is driving mono-materials constructions and this will encourage the use of polyolefin nonwovens (PO-NWs) in constructions with PO-foams and PP substrates[6]
- Nonwovens are gaining momentum in the automotive marketplace either as a direct substitute for wovens and knits currently used in face fabrics or as layers in the construction of most interior modules. For example, spunbonded nonwoven fabrics are used for motor vehicle headliners, trunk liners and carpet backing. New nonwoven applications are emerging in headliners, luxury fabrics and floor/acoustic modules.

[4] http://www.agr.gc.ca/misb/spcrops/sc-cs_e.php?page=textiles
[5] http://www.riotinto.com/media/downloads/speeches/IM%20Forum%20presentation%20Nov 04.pdf
[6] http://www.robertellerassoc.com/articles/techtex04.pdf

However, the barriers to entry into this market are very high. Supply contracts are managed by the vehicle OEM's preferred suppliers - Tier 1 and Tier 2 suppliers in particular – who provide the OEMs with finished automotive components and automotive parts. They in turn contract out the manufacture to a network of suppliers. The market is highly competitive and contracts are awarded to suppliers who can meet delivery at a competitive price and quality. In order to be competitive significant economies of scale are typically required.

Countries who compete in this market are Brazil, Slovakia, Slovenia and Korea. And while South Africa might have the capacity to take advantage of demand in terms of technology and market contacts, a key inhibiting factor to local industry is import parity pricing where local downstream producers cannot compete with cheap imports. Also, while the domestic vehicle manufacturing output is increasing as major automotive producers such as Toyota and Mercedes Benz in South Africa raise their production goals, the production runs tend to be too short to warrant a major Tier 1 or Tier 2 supplier to set up in South Africa and source plastics locally.

Overall conclusions and recommendations

Currently low export capabilities

Overall, the South African polypropylene industry currently has limited export capabilities for PP and nonwoven products. Total exports for the PP and nonwoven products included in this analysis totalled US$135.4m in 2003. With the exception of nonwoven products for Europe, South Africa has a low export market penetration of the target markets:

- According to the ITC trade statistics analysed, there were no exports to the US from South Africa for the PP products included in this study. However, 5% of current nonwovens exports are destined for the US.
- South Africa's exports to Europe in 2003 represented 4% of South Africa's total PP product exports. However, Europe receives over 60% of current nonwovens exports from South Africa.
- South Africa's % share of market value for the total PP product-market-opportunities analysed is typically <0.01%. For nonwoven products South Africa's penetration of the target export markets is also low – i.e. South Africa's % share of market value for the product-market-opportunities analysed is typically <3%.

Based on the definition of the industry value chain used, there currently appears to be only limited beneficiation of PP products for export. In 2003 approximately 93% of total PP exports in value terms were in primary form. Overall, exports for primary PP products to European markets present the strongest potential market opportunities.

While the upstream producers of primary PP product in South Africa, Sasol and Dow Plastics, are sophisticated players with existing export capabilities and market relationships, the plastics conversion sector in South Africa is still in its infancy. While some of these downstream PP players are currently exporting secondary PP products (often to their overseas principles), the majority of the plastics converters are focused on the domestic market. Given the continued strength of the Rand, these businesses are challenged to defend their domestic markets from lower cost imports. This pressure on their domestic business leaves little financial capacity and strategic resource for investments in export markets where a long-term investment is required. Overall, the downstream PP plastics producers therefore face considerable challenges in developing export business in the target markets of Europe and the US.

Potential opportunities to grow the existing export base

With the exception of primary PP products, South Africa currently has very limited export capability in high potential product opportunities. In particular, HS 392020 (Film and sheet etc, non-cellular etc, of polymers of propylene) features strongly in the high potential product-to-market opportunities. South Africa currently exports this PP product to its African neighbours only.

However, the trade flow analysis indicates that there may be opportunities to grow exports in product segments where South Africa already has PP export capability. Based on current supply capabilities (as indicated by current export volumes to the target markets) expansion of the following product segments should be considered – both through growing existing trade relationships and tapping into high potential new export markets for these product segments:

- For HS 550340 - Staple fibres of polypropylene, not carded or combed
  - Grow existing trade relationships: South Africa has a share of market value of between 0.75% - 2.1% in Germany, UK, Belgium and Austria.
  - Explore potential new export markets:
    - The EU accounted for 90% of world imports of this product in 2003 with a total import value of US$234.7m. The main import markets are Germany (33% of total), Italy (27% of total), and France (10% of total). However, trade is dominated by intra-regional supply (94% of total supply), and Denmark and Belgium are the leading regional suppliers. In terms of non-EU suppliers, South Africa competes with the US and Iran.
    - The US imported US$7.1m worth of this product in 2003; over 89% is supplied by non-NAFTA suppliers, in particular the UK, Denmark, Austria and South Korea.
- For HS 560313 - Nonwovens, man-made filaments weighing 70-150g/m2
  - This product category features strongly in the top 30 product-to-market opportunities adjusted for intra-regional trade (with rank 7, 9, 18 and 24).
  - Grow existing trade relationships: South Africa has a share of market value of 20% in Belgium and 8% in the UK. The UK is one of the largest importers of this product in the EU with a share of 13.5 of total imports.
  - Explore potential new export markets:
    - The EU accounted for ~43% of world imports for this product in 2003 with a total import value of US$351.1m. The main import markets other than the UK are Germany (19% of total) and France (13% of total). However, ~82.5% of total trade is made up by intra-regional supply, and Germany, the Netherlands, Luxembourg and Italy are the leading regional suppliers. In terms of non-EU suppliers, South Africa competes with the US and Israel.
    - The US imported US$74.45m worth of this product in 2003 (or 9% of world imports); over 82% is supplied by non-NAFTA suppliers, in particular Germany, Luxembourg, UK and Sweden, while Japan and Argentina were significant non-EU/NAFTA suppliers.

In developing a growth strategy for the emerging PP conversion industry, export opportunities with African trading partners should also be considered. Given the relatively large share of PP exports to neighbouring countries, growth in PP exports to these countries might be stimulated as their economies grow.

South Africa also has existing trading relationships with Asia for PP products. These markets present strong future opportunities for primary PP exports. In particular, the growth of the Chinese industry is driving demand for primary PP. With average annual growth rates of 7.6% to 2010, China is expected to become the largest consumer of PP after the US.

However, given the prevalence of low-cost domestic producers and the emergence of China as the leading centre for semi-finished and finished goods manufacture, it is unlikely that there are opportunities for developing trade in beneficiated PP products with the Asian markets.

Potential export market opportunities to develop in the longer-term

In addition to opportunities for primary PP products, the trade flow analysis indicates that potential market opportunities exist for the following product-to-market combinations for PP and nonwoven products. However, South Africa currently has little or no export capability in these product segments (as per the trade flow statistics).

- For 392020 (Film and sheet etc, non-cellular etc, of polymers of propylene) to the US, Belgium, Germany, France, and the UK
    - Existing exports of US$4m mainly to African countries (i.e. Zimbabwe, Mozambique, Kenya, Malawi and Nigeria) in 2003; US$63,000 or 2% of total exports to France plus small volumes to Belgium and Germany.
- For 560312 (Nonwovens, man-made filaments weighing 25-70g/m2) to the US, UK, Germany, Spain, and Italy
    - Existing exports were US$3.23m in 2003. Over 62% of exports were to Europe, mainly Spain (51% of total exports), Portugal (6%) and Belgium (5%). Mauritius (with 20% of total exports) and Zimbabwe (5%) were the main trading partners in Africa.
- For 560311 (Nonwovens, man-made filaments weighing <25g/m2) to the US and Germany
    - Existing exports of only US$179,000 in 2003 to Germany (53% of total exports), Zimbabwe (27%) and Australia (20%).
- For 392190 (Film and sheet etc, nes of plastics) to the US, Germany, France, UK, Italy, Belgium, Austria, and Spain
    - Existing exports of US$12.3m in 2003 to a wide range of markets including the Netherlands (20%), Nigeria (16%), the US (11%), Zimbabwe (8%) and Sweden (7%).

Drivers of competitiveness and sector development requirements

The scope of this analysis was focused on the statistical analysis of trade flows. A detailed assessment of market drivers and market opportunities on the demand side and South Africa's competitiveness on the supply side was outside the scope of this study. However, based on the trade flow patterns and a high level review of market trends in the global PP industry, the study identified a number of critical success factors and drivers of competitiveness that must be met in order to realise any of the potential export opportunities and develop the PP conversion industry in South Africa:

- Competitive total landed cost is strongly influenced by transportation costs
    - Given the distance from South Africa to the target exports markets and the bulky, transportation costs are a major driver of total landed cost competitiveness.
    - Only PP products that are easy to pack into crates or containers and/or that can be stuffed or compressed (e.g. nonwoven textiles) will be likely to succeed. In contrast, it is not economical to ship plastic products which are bulky and often low value (e.g. large moulded goods such as appliance covers).
    - It is recommended that government and the private sector need to work together to ensure a seamless and cost-effective transportation and distribution of South African PP products to the target markets. This will be critical to ensuring competitiveness of the emerging PP conversion industry as it seeks to gain a footing in the export markets.

  - Given the lack of current exports to the US, the PP industry should investigate linking into other chemicals sector programmes (e.g. around bulk transportation) or trade promotion programmes to facilitate market entry.
  - Given the successful exports of certain PP products to key EU markets (e.g. Germany, Belgium, Spain), the industry should investigate opportunities to use these market relationships to enter other markets and / or introduce other PP products.
- Competitive operating costs rather than raw material costs
  - The major raw material inputs in polypropylene production are internationally traded commodities. Their prices are therefore largely regulated by international trading markets.
  - While the recent rise in raw materials costs is drastically squeezing margins for resin suppliers and converters, these price increases affect the entire industry and can to a certain extent be passed on to customers.
  - In order to stay cost competitive plastics businesses need to ensure they have competitive operating costs – including labour costs and productivity, utilities, and trade costs – and run efficient operations. This is critical to be competitive with competing polypropylene suppliers from, e.g., India and China.
- Competitive production technology
  - Innovation plays a key role in maintaining a competitive status in these markets. High tech conversion technology therefore plays an important role in sustained growth in the industry.
  - Government support may be required to assist the emerging industry to develop an appropriate technology platform. Potential support measures include:
    - Support research efforts into new product development, process optimisation and technology transfer.
    - Facilitate access to capital for technology upgrades.
    - Facilitate foreign investment by a leading PP converter who can bring technology, production know-how and market relationships.
- Building effective channels to market and customer relationships
  - The target export markets have a large domestic and regional production base with established contacts to potential buyers, reasonable prices and good service. Without a personal presence, an established agent or distribution network, or participation at relevant trade fairs, it will be very difficult for emerging South African exporters to succeed against such tough competition.
  - Government support is required to assist emerging exporters to develop costly and time-consuming trade relationships and market their products overseas. Potential measures include:
    - Facilitate cooperation in the sector for joint marketing initiatives and trade missions.
    - Financial and marketing assistance for sector-wide trade missions.
    - Export marketing grants to cover marketing and international travel expenses required to develop business-to-business relationships.

In addition, to the above factors there are a number of competitive threats that can seriously affect the emerging PP conversion industry:

- Energy and monomer costs are widely expected to continue to increase. The PP industry needs to build scenarios for this upward pressure of prices when developing plans for downstream beneficiation. PP suppliers should take into account the likely impact of potential further increases in energy and monomer costs on their competitiveness and their export readiness.
- PP suppliers should take into account the threats presented by Asian PP producers

Important note:
- Further analysis and careful evaluation of potential opportunities is strongly recommended in order to build on the findings of this statistical analysis of PP trade flows.
- Suggestions on the focus of additional research and recommended research methodologies are set out below in the way forward.

Way forward

- This high-level trade flow analysis provides the initial basis for identifying potential areas of industry development and trade promotion action. In particular, this analysis has highlighted product-to-market combinations for further investigation.
- The scope of this analysis is predominantly focused on the statistical analysis of trade flows. A detailed assessment of market drivers and market opportunities on the demand side and South Africa's competitiveness on the supply side for priority products is recommended prior to detailed strategy development and implementation. These priority products could include products both inside and outside the chemicals sector, where development of downstream industries would require collaboration with other sectors in terms of their strategy development processes.
  - Issues for a detailed demand side analysis include:
    - Analysing the demand characteristics and industry structure in key target markets
    - Determining key potential buyers and their supply needs
    - Identifying any obstacles to imports in target markets
  - Issues for a detailed assessment of supply conditions include:
    - Analysing the supply capabilities and industry structure
    - Identifying any obstacles to exports of priority products
    - Assessing supply capacity increases and investments required
    - Determining specific support requirements at the enterprise and industry level (e.g. logistics, new product development, etc.)
  - Competitive scenarios should also be developed
    - Despite the lack of current SA exports to the US, additional market trends that may result in opportunities that are not evident from the historical trade flow data should be explored. For example, over recent years, imports from Asia appear to have grown strongly across other resin categories such as PET, PS and PVC, where Asian resin producers often have a 15-20% price advantage over domestic suppliers. What triggers in the market place would need to be present to create a more favourable future scenario for PP imports into the US?
  - In addition, the export value chain (i.e. from sourcing and production through to marketing, transportation and selling in the export market) should be mapped and a comparative cost analysis along the entire value chain conducted. This is critical to identifying overall cost competitiveness vis-à-vis competing suppliers and drivers of competitiveness, as well as assessing likely success of export market penetration.