

**Supplemental Appendix B to**

**ENSURING  
PATIENT CARE  
The Role of the  
HFC MDI**

**2<sup>ND</sup> EDITION**

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## IPAC'S INITIAL EMISSIONS PROJECTIONS FOR HFC MDIs: 2010 AND 2015\*

| <b>2010 PROJECTIONS<br/>(1999 IPAC ORIGINAL ESTIMATES)</b>  | <b>2015 PROJECTIONS<br/>(1999 IPAC ORIGINAL ESTIMATES)</b>  |
|---|---|
| <p style="text-align: center;"><b>7,500 to 9,000</b> metric tonnes of HFCs<br/><i>10.8 to 12.9 million metric tonnes<br/>of CO<sub>2</sub> equivalent</i></p> <p>§ This projection was developed by IPAC in 1999 and is primarily based upon a survey of IPAC member companies (including 3M) for 1998 data. The data was most reliable for IPAC companies' major markets (e.g., Europe and North America). The projections include an estimate for non-IPAC companies and the developing world. The range reflects assumed market growth rates of 1.5% to 3.0%. (The basis for these assumed growth rates is discussed below).</p>   | <p style="text-align: center;"><b>9,000 to 10,500</b> metric tonnes of HFCs<br/><i>12.9 to 15.0 million metric tonnes<br/>of CO<sub>2</sub> equivalent</i></p> <p>§ This range extrapolates from IPAC's 1999 estimated projections and beginning with the "high end" figure of 9,000 assumes a range of flat growth to 3% growth from a baseline of 9,000 tonnes of HFCs.</p>                   |
| <b>2010 PROJECTIONS<br/>(TEAP/IPAC 2001 DATA)</b>   | <b>2015 PROJECTIONS<br/>(TEAP/IPAC 2001 DATA)</b>   |
| <p style="text-align: center;"><b>11,275 to 12,865</b> metric tonnes of HFCs<br/><i>18.26 to 20.84 million metric tonnes<br/>of CO<sub>2</sub> equivalent</i></p> <p>§ In response to the request from the authors of the MDI chapter of the IPCC Special Report, IPAC recently reviewed its emissions projections and analyzed more recent data and information available since 1999. The range above is primarily based upon TEAP figures for the volume of CFCs used in the production of MDIs for 2001 and IPAC data on HFCs collected for 2001.</p> <p>§ This range is somewhat higher than IPAC's original estimate set forth above. This is likely due to the fact that IPAC's 1999 estimate was based on hard data only from IPAC member companies. The 2001 TEAP figures presumably are more accurate for volumes used in the developing world and non-IPAC MDI companies.</p> <p>§ IPAC's 2010 projections are also consistent with the 2010 emissions projection estimated by Enviro March in its December 2000 report, submitted to the European Climate Change Programme: <u>10,230 metric tonnes</u>.<sup>1</sup></p> | <p style="text-align: center;"><b>12,865 to 14,915</b> metric tonnes of HFCs<br/><i>20.84 to 24.16 million metric tonnes<br/>of CO<sub>2</sub> equivalent</i></p> <p>§ This range extrapolates from the 2010 estimated projection (TEAP/IPAC 2001) and beginning with the "high end" figure of 12,865 assumes a range of flat growth to 3% growth from a baseline of 12,865 tonnes of HFCs.</p> |

\* Based on information previously communicated in May 2004.

<sup>1</sup> See, STUDY ON THE USE OF HFCs FOR METERED DOSE INHALERS IN THE EUROPEAN UNION prepared by Enviro March (December 2000), following submission to European Climate Change Programme, at 11.

## SUMMARY OF ASSUMPTIONS

- § Worldwide, all MDIs will use HFCs by 2010. (Due to the slow rate of transition in some countries, it is not currently possible to rule out that some small volumes of CFCs (less than 2000 tonnes) may still be used in MDIs after 2010.)
- § The market growth rates of 1.5% and 3.0% for the period through 2010 were selected based upon knowledge of the existing and forecasted market for products intended for the treatment of respiratory illnesses. Originally used in IPAC's 1999 projections, these forecasted market growth rates have been validated for the years 1996 to 2001 by ATOC. It should be noted that these market growth rates likely represent a "high end" estimate given that the market rate for MDIs may remain constant or even slightly decline into the next decade given market trends in the uptake of existing propellant-free MDI alternatives (e.g., DPIs) and the projected entry onto the market of novel propellant-free therapies (e.g., soft mist inhalers, improved oral tablets). At present, many drugs in active clinical research or early development are designed to be delivered orally or by injection. In a recent report issued by the UK on HFCs, emissions from MDIs are expected to decline post-2010. See EMISSIONS AND PROJECTIONS OF HFCs, PFCs, AND SF<sub>6</sub> FOR THE UK AND CONSTITUENT COUNTRIES (July 2003), authored by AEA Technology, at pages 73-74; 119. Our emission projections assume MDI market growth rates of 0% to 3% for the 2010 to 2015 period.
- § Salbutamol MDIs currently represent approximately 50% of the overall market for MDIs. Up to 2015, it is not envisaged that these products will be replaced by non-propellant alternatives.
- § The relative average density of HFCs used in MDIs is approximately 8% less than the density of CFCs used in MDIs.
- § Two HFCs are used as medical propellants. The assumed average ratio of HFC 134a (GWP: 1300)/HFC 227 (GWP: 2900) is 80%/20%. We have also seen recent publications and data that assume a ratio of 90% (134a)/10% (227) and concur that this is a currently valid and equally reliable estimate.