IFPRI BRIEF TEMPLATE

Check One: ☐**Project** ☒**Review** ☐**Collaboration**
☐**Workshop** ☐**Other**

Descriptive Title	Sustainability of Particle Formation Technologies – reduction in water/solvents and energy – reduced CO_2 footprint
Working Title[1]	Sustainability of Particle Formation Technologies – making small spherical granules
Technical Area[2]	Formation
Date	18/6/21
Short Description	Currently a workhorse of particle formation processes is spray drying and this is a very energy intensive process where solvents such as water are added to simply be removed in the next step. This review is to identify if there are other processes available that can produce particles with similar properties to spray dried particles but made via a more sustainable route. Our interest is in routes to making multi component granules with narrow particle property distributions (chemical distributions across PSD/Porosity differences/narrow PSD) with a low carbon footprint An example would be using a balling process but producing smaller particles.
Objectives	• Understanding the research on looking at the sustainability of particle processes • Understand the limitations of the alternative process technologies with respect to the particle characteristics such as porosity and flow • Techniques available to introduce porosity during the process • The technical problems that need to be resolved in order to break the contradictions – porosity is generated by the evaporation of water – with no water how do you generate porosity? • Comparison of the energy consumption, CO_2 footprint, waste recycle streams of the various processes

[1] Title used in meeting agendas and file archives
[2] One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

	• The commercial readiness and the scale of the process – the ability to do 1000's of tons not just kgs • Resources used per kg of product
Scope	Not just pharma and food – covering inorganics also Cover all scales – commodity goods as well as pharma. Small granules – 100 – 300 micron particles with a narrow size distribution Porosity included in the particles Included supercritical CO_2 as a potential route

Recommended Contractors (2 or 3)		
Name	**Institution**	**Email Address**

Submitted By:	
Name	**Organization**
Judith Bonsall	Unilever
Mike Wemple	Scherwin Williams
Joel Caragay	P&G
Ninna Jokil	Haldor Topsoe